

HOUSATONIC RIVER BASIN  
DANBURY CONNECTICUT

# MERCERS POND DAM CT 00068

## PHASE I INSPECTION REPORT NATIONAL DAM INSPECTION PROGRAM



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DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
WALTHAM, MASS. 02154

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PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

## NATIONAL DAM INSPECTION PROGRAM

### PHASE I INSPECTION REPORT

Identification Number:	CT 00068
Name:	Mercers Pond Dam
Town:	Danbury
County and State:	Fairfield County, Connecticut
Stream:	Tributary to Kohanza Brook
Date of Inspection:	April 22, 1980

### BRIEF ASSESSMENT

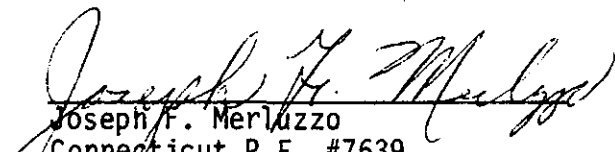
Mercers Pond Dam is an earth embankment approximately 400 feet long and 17 feet high. Granite blocks line the downstream face (250± feet). A 39-foot long spillway is located at the western end of the dam. There is a 24-inch discharge pipe with a slide gate on the upstream face of the dam. The gate is not operable. The drainage basin is 4.5 square miles of which 3.3 square miles is controlled by another dam upstream. There is approximately 27 acre-feet of storage available.


The assessment of the dam is based on the visual inspection, past operational performance and hydraulic/hydrologic computations. The dam is judged to be in fair condition with several areas that require attention. These areas include seepage along the toe of the dam, the poor condition of the stone face and the nonoperating status of the discharge pipe.

The dam is classified as small and has a high hazard potential in accordance with guidelines established by the Corps of Engineers. The test flood for these conditions is the Probable Maximum Flood (PMF). The test flood inflow is 6,150 cfs and the routed test flood outflow is 5,885 cfs. The test flood will overtop the dam by 2.75 feet.

It is recommended that the owner engage the services of a qualified registered engineer experienced in the design of dams to investigate the seepage along the toe of the dam, the poor condition of the granite stone face and prepare a detailed hydraulic/hydrologic study to determine the spillway's adequacy.

Additional recommendations and remedial measures are included in Section 7 and should be implemented within one year after receipt of the Phase I Inspection Report.

  
Joseph F. Merluzzo  
Connecticut P.E. #7639  
Project Manager

  
Gary J. Giroux  
Connecticut P.E. #11477  
Project Engineer

## PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Inspections. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Inspection is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Inspection; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I Inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the Spillway Test Flood is based on the estimated Probable Maximum Flood for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and variety of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Inspection does not include an assessment of the need for fences, gates, "no trespassing" signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with Occupational Safety and Hazard Administration's (OSHA) rules and regulations is also excluded.

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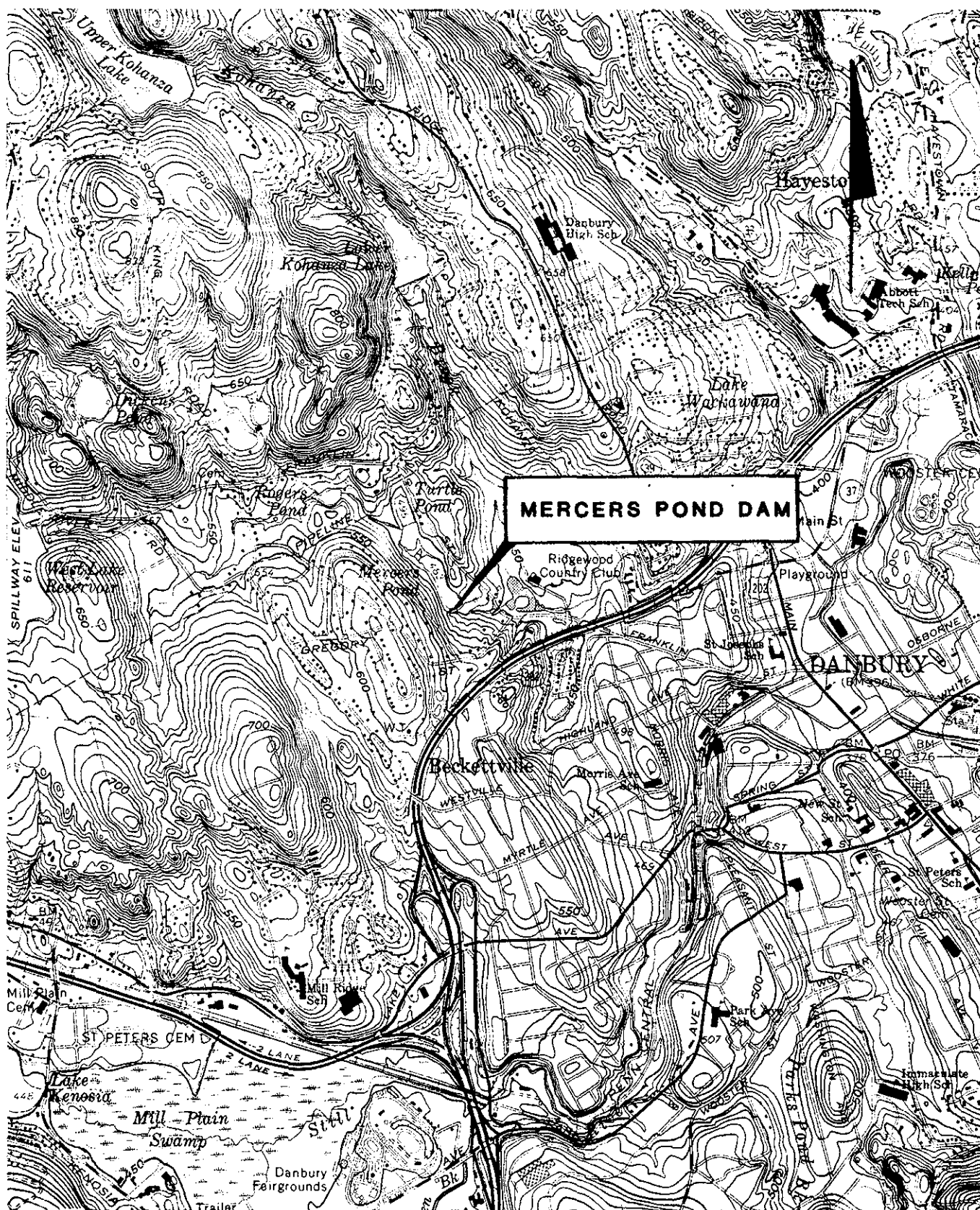
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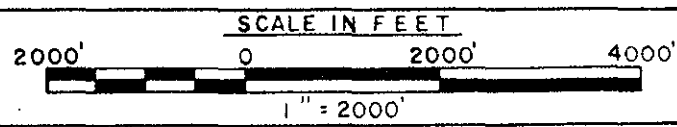


MERCERS POND DAM



QUADRANGLE: **DANBURY, CT**

**US ARMY, CORPS OF ENGINEERS**  
**NEW ENGLAND DIVISION**  
**WALTHAM, MASS.**



**LOCATION MAP**

PHASE I INSPECTION REPORT  
MERCERS POND DAM CT 00068

SECTION 1 - PROJECT INFORMATION

1.1 General

a. Authority - Public Law 92-367, August 8, 1972 authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Storch Engineers has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed were issued to Storch Engineers under a letter of March 6, 1980 from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-80-C-0035 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection -

(1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

(2) Encourage and prepare the states to initiate quickly effective dam safety programs for non-Federal dams.

(3) To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location - Mercers Pond Dam is located approximately 1 mile north of the Route 7 and Interstate 84 interchange in the City of Danbury, Connecticut

(See Location Map). The coordinates of the dam are 41°-24' north latitude and 73°-28.5' west longitude. The dam is located on a tributary of Kohanza Brook in the Housatonic River Basin.

b. Description of Dam and Appurtenances - Mercers Pond Dam is an earth embankment 400 feet long and 17 feet high. The dam is "L" shaped with one leg fortified on the downstream face with granite stone blocks. The length of the granite stone face is approximately 250 feet. The remainder of the downstream face is vegetated.

The spillway is located at the western end of the dam and consists of a 39-foot long concrete weir. Adjacent to the spillway and to the north is a headwall with a slide gate to a 24-inch discharge pipe. This discharge pipe outlets approximately 50 feet downstream. The gate is not operable.

c. Size Classification - Mercers Pond Dam has a maximum height of 17 feet and a maximum storage of 61 acre-feet at the top of the dam. In accordance with the Recommended Guidelines for Safety Inspection of Dams established by the Corps of Engineers, the dam is classified as small (height less than 40 feet, storage less than 1,000 acre-feet).

d. Hazard Classification - The Mercers Pond Dam is classified as having a high hazard potential. Failure of the dam could result in the loss of more than a few lives and cause minor property damage. Approximately 700 feet downstream is a nursing home built immediately adjacent to the brook. Estimated flow and water depth just prior to dam failure at this location is 1,036 cfs at 3 feet and just after dam failure is 12,840 cfs at 9 feet.

e. Ownership - Mercers Pond Dam is owned by:

Westover Center, Inc.  
c/o F. L. Adler  
136-138 Franklin Street, Ext.  
Danbury, Connecticut 06810

f. Operator - The person in charge of day-to-day operation of the dam is:

Mr. F. L. Adler  
136-138 Franklin Street, Ext.  
Danbury, Connecticut 06810  
(203) 748-0818

g. Purpose of Dam - The dam impounds Mercers Pond which is used for recreation.

h. Design and Construction History - Mercers Pond Dam was constructed around 1900. There are no design computations or drawings for the dam. The spillway was reconstructed in 1968, per order of the Department of Environmental Protection (DEP). This reconstruction lowered the spillway crest 2.5 feet to increase its capacity. The plans were designed by Philip W. Genovese and Associates, Inc., Hamden, Connecticut.

i. Normal Operating Procedures - There are no normal operating procedures.

### 1.3 Pertinent Data

a. Drainage Area - The Mercers Pond drainage basin is located in the City of Danbury, Connecticut and is irregular in shape. The area of the drainage basin is 4.5 square miles (Appendix D - Plate 3) of which 3.3 square miles is controlled by West Lake Reservoir Dam. This reservoir is a water supply for the City of Danbury. Therefore, its operation is not for flood control. Approximately 10 percent of the drainage basin is natural storage and approximately 50 percent is undeveloped. The topography is rolling with elevations ranging from 1,067 (NGVD) to 480.7 (NGVD) at the spillway crest.

b. Discharge at Damsite - There are no records available for discharge at the dam.

(1) Outlet works (conduit) size:	24 inches
Invert elevation (feet above NGVD):	477.0

Discharge Capacity at top of dam:	40 cfs
(2) Maximum known flood at damsite:	unknown
(3) Ungated spillway capacity at top of dam:	1,036 cfs
Elevation (NGVD):	484.3
(4) Ungated spillway capacity at test flood elevation:	2,050 cfs
Elevation (NGVD):	487.05
(5) Gated spillway capacity at normal pool elevation:	N/A
Elevation (NGVD):	N/A
(6) Gated spillway capacity at test flood elevation:	N/A
Elevation:	N/A
(7) Total spillway capacity at test flood elevation:	2,050 cfs
Elevation (NGVD):	487.05
(8) Total project discharge at top of dam:	1,076 cfs
Elevation (NGVD):	484.3
(9) Total project discharge at test flood elevation:	5,885 cfs
Elevation (NGVD):	487.05
c. Elevation (feet above NGVD)	
(1) Streambed at toe of dam:	467.3
(2) Bottom of cutoff:	unknown
(3) Maximum tailwater:	472

	(4) Normal pool:	480.7
	(5) Full flood control pool:	N/A
	(6) Spillway crest (ungated):	480.7
	(7) Design surcharge (original design):	unknown
	(8) Top of dam:	484.3
	(9) Test flood surcharge:	487.05
d.	Reservoir (length in feet)	
	(1) Normal pool:	900
	(2) Flood control pool:	N/A
	(3) Spillway crest pool:	900
	(4) Top of dam:	950
	(5) Test flood pool:	1,000
e.	Storage (acre-feet)	
	(1) Normal pool:	34
	(2) Flood control pool:	N/A
	(3) Spillway crest pool:	34
	(4) Top of dam:	61
	(5) Test flood pool:	87
f.	Reservoir Surface (acres)	
	(1) Normal pool:	6
	(2) Flood control pool:	N/A
	(3) Spillway crest:	6
	(4) Test flood pool:	10
	(5) Top of dam:	8.5
g.	Dam	
	(1) Type:	earth embankment/ granite block face

(2) Length:	400 feet
(3) Height:	17 feet
(4) Top width:	12 feet
(5) Side slopes:	U/S - 2:1 D/S - 1:6
(6) Zoning:	unknown
(7) Impervious core:	unknown
(8) Cutoff:	unknown
(9) Grout curtain:	unknown
(10) Other:	N/A
h. Diversion and Regulating Tunnel	N/A
i. Spillway	
(1) Type:	concrete-broad crested weir
(2) Length of weir:	39 feet
(3) Crest elevation (without flashboard):	480.7
(4) Gates:	N/A
(5) U/S channel:	riprap and natural ground
(6) D/S channel:	riprap and natural channel
(7) General:	N/A
j. Regulating Outlets	
(1) Invert elevation (NGVD):	477
(2) Size:	24 inches
(3) Description:	reinforced concrete pipe
(4) Control Mechanism	manually operated slide gate
(5) Other:	gate not operable

## SECTION 2 - ENGINEERING DATA

### 2.1 Design Data

There are no design computations available; however, there are drawings for the reconstructed spillway.

### 2.2 Construction Data

The dam was constructed at the turn of the century, however, there are no records available for the construction. The spillway was reconstructed in 1968 per order of DEP. The reconstruction consists of lowering the spillway crest 2.5 feet to increase its capacity. This was accomplished by cutting the concrete of the existing spillway. This reconstruction work was designed and supervised by Philip Genovese and Associates, Inc.

### 2.3 Operation Data

The slide gate is presently frozen closed. There are no operating procedures.

### 2.4 Evaluation of Data

a. Availability - There were no computations available, however, there are drawings for the reconstructed spillway. These drawings are available from the DEP.

b. Adequacy - The information made available along with the visual inspection, past performance history and hydraulic/hydrologic assumptions were adequate to assess the condition of the facility.

c. Validity - Due to the lack of available data, the conclusions and recommendations found in this report are based on the visual inspection and hydraulic/hydrologic computations.

## SECTION 3 - VISUAL INSPECTION

### 3.1 Findings

a. General - The visual inspection was conducted on April 22, 1980 by members of the engineering staff of Storch Engineers, D. Baugh and Associates, Inc. and Matthews Associates. A copy of the visual inspection check list is contained in Appendix A of this report. Selected photos of the dam and appurtenant structures are contained in Appendix C.

In general, the overall condition of the dam and its appurtenant structures is fair.

b. Dam - The dam is an earth embankment with portions of the downstream faced with granite blocks. The condition of this face varies. The eastern portion of the wall is in fairly good condition, the central portion of the wall seems to be bulging with the top stones missing and the western portion of the dam has completely fallen down (Photos 2, 5 and 7). The remainder of the downstream embankment is on a 2:1 slope with grass and some small trees growing on it. The top of the embankment is in good condition with grass and some brush growing on it. There are several low spots along the top of the dam, however, these low spots seem to have always been there and not a result of settlement. The upstream face of the dam is riprapped and is in good condition, but is overgrown with brush and weeds (Photo 1).

There were several areas along the toe of the dam that are wet and seepage is coming through the dam (Photos 7 and 8). This seepage was estimated to be 10 to 15 gallons per minute. This seepage is clear and does not show any signs of particle movement.

c. Appurtenant Structures - The concrete headwall for the slide gate is on the upstream side of the embankment and is in good condition, however, the slide gate is not operating and is closed. The 24-inch concrete pipe is in good condition (Photo 6).

The spillway is a fixed concrete weir that appears to be in good condition. The training walls for the spillway are dry rubble and are in fair condition, but could be a problem during high flow (Photo 3).

d. Reservoir Area - The area immediately adjacent to the pond is gently sloped on the east side and steep on the west. Both sides are wooded and in a natural state. The shoreline shows no signs of sloughing or erosion and there is no development adjacent to the reservoir. A rapid rise in water level of the reservoir will not endanger any life or property.

e. Downstream Channel - The spillway channel is in a natural state with rocks and boulders lining the bottom. The channel is well defined with steep side slopes (Photo 4a).

### 3.2 Evaluation

Overall, the general condition of the dam is fair. The visual inspection revealed items that lead to this assessment, and apparent areas of distress such as:

- a. Seepage through the embankment and the toe.
- b. Inoperation of the discharge pipe.
- c. Vegetation on the downstream face along the toe of the dam.
- d. Bulging of the granite block wall and the total collapse of the wall in one area.

## SECTION 4 - OPERATIONAL AND MAINTENANCE PROCEDURES

### 4.1 Operational Procedures

a. General - The operation of this facility is strictly for the purpose of recreation and the water level is kept at spillway crest only because the slide gate is inoperable.

b. Description of any Warning System in Effect - There is no warning system in effect for this dam.

### 4.2 Maintenance Procedures

a. General - This dam appears to be given the minimum of maintenance.

b. Operating Facilities - The gate and the discharge pipe are not operating and have not been for sometime.

### 4.3 Evaluation

The maintenance of the dam is less than adequate in that proper care of the dam embankment should be on a regular basis. The slide gate should be maintained in working order and there should be a proper operating procedure and warning system in effect.

## SECTION 5 - EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

### 5.1 General

The Mercers Pond Dam is an earth embankment dam approximately 450 feet long and 17 feet high. Approximately 250 feet of the downstream face is granite block. The spillway is a concrete weir, 39 feet long. A 24-inch reinforced pipe passes through the dam with a slide gate on the upstream side of the embankment. The slide gate is inoperable.

The watershed encompasses 4.5 square miles of which 3.3 square miles is controlled by West Lake Reservoir Dam. Approximately 50 percent of the drainage basin is developed. The topography is rolling with the terrain rising 586 feet from the spillway crest.

The pond has a total capacity of 61 acre-feet when the pond is at the top of the embankment and 34 acre-feet at the spillway crest. Therefore, there is approximately 27 acre-feet of storage available. The test flood outflow for this dam is 5,885 cfs and the spillway capacity is 1,036 cfs or approximately 17.6% of the test flood outflow.

### 5.2 Design Data

No design data is available.

### 5.3 Experience Data

The Mercers Pond Dam has experienced all the major storms of the 1930's and 1950's and most recently January, 1979. The flood of record resulted from the storm of October, 1955. No records are available for this flood, however, from conversations with Mrs. Adler, the dam was sandbagged and the eastern portion was overtopped during this storm.

#### 5.4 Test Flood Analysis

Based on the guidelines found in the Recommended Guidelines for Safety Inspection of Dams, the dam is classified as a small structure with a high hazard potential. The test flood for these conditions range from 1/2 the Probable Maximum Flood (PMF) to the PMF. The PMF was used because of the probable loss of life.

Using the guide curves established by the Corps of Engineers (rolling terrain), the test flood inflow is 6,150 cfs. The routing procedure established by the Corps gives an approximate outflow of 5,885 cfs. The spillway capacity is approximately 1,036 cfs or approximately 17.6% of the test flood outflow. The test flood will overtop the dam by approximately 2.75 feet.

In the development of the test flood inflow, it was assumed that the peak outflow from West Lake Reservoir Dam and the peak runoff from the independent watershed occurred at the same time. This simplified the development of the inflow hydrograph, the routing through the dam and the outflow hydrograph for Mercers Pond Dam.

Storage behind the dam was assumed to begin at the elevation of the spillway crest. Storage was determined by an average area depth analysis. Capacity curves for the spillway assumed weir flow.

#### 5.5 Dam Failure Analysis

A dam failure analysis was performed using the Rule of Thumb method in accordance with guidelines established by the Corps of Engineers. Failure was assumed to occur when the water level in the reservoir was at the top of the dam.

The spillway discharge just prior to dam failure is 1,036 cfs and will produce a depth of flow of approximately 3 feet several hundred feet downstream

from the dam. The calculated dam failure discharge is 12,840 cfs and will produce a depth of flow of approximately 9 feet several hundred feet downstream from the dam or an increase in water depth at failure of approximately 6 feet. The failure analysis covered a distance of approximately 2,000 feet downstream where the depth of flow was calculated to be 4.5 feet or an increase in depth at failure of 1.5 feet.

Failure of the Mercers Pond Dam may result in the loss of more than a few lives and may damage at least three structures. Located approximately 700 feet downstream is a nursing home that was built immediately adjacent to the brook. At this location and prior to dam failure, the flow in the brook will be 1,036 cfs at 3 feet deep. At failure the flow will be 9,300 cfs at 8.8 feet or an increase of 5.8 feet. This increase could damage the structure because of its close proximity to the brook. Due to the age and health of the inhabitants, this could be disasterous.

## SECTION 6 - EVALUATION OF STRUCTURAL STABILITY

### 6.1 Visual Observations

The general structural stability of the dam is fair as evidenced by the vertical, horizontal and lateral alignment. The granite block face of the dam varies in condition from poor to good. The eastern half of the stone face is in good condition with good alignment. The central portion of the stone face has the uppermost stones removed and appears to have a bulge in the face. The western portion of the stone face has fallen down. It is not known when this happened or what caused it.

The spillway weir seems to be in good condition, but the training wall just below the spillway is in poor condition and could cause problems during high flow.

### 6.2 Design and Construction Data

The original design and construction data are not available. However, there is design and construction data available for the reconstruction of the spillway.

### 6.3 Post-Construction Changes

Since the reconstruction of the spillway, there have been no post-construction changes.

### 6.4 Seismic Stability

The dam is located in Seismic Zone 1 and in accordance with Recommended Phase I Guidelines does not warrant a seismic analysis.

## SECTION 7 - ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

### 7.1 Dam Assessment

a. Condition - After consideration of the available information, the results of the inspection, contact with the owner and hydraulic/hydrologic computations, the general condition of Mercers Pond Dam is fair.

b. Adequacy of Information - The information available is such that an assessment of the safety of the dam should be based on the available data, the visual inspection results, past operational performance of the dam and its appurtenant structures and computations developed for this report.

c. Urgency - It is considered that the recommendations suggested below be implemented within one year after receipt of this Phase I Inspection Report.

### 7.2 Recommendations

The following recommendations should be carried out under the direction of a qualified registered engineer.

- a. Seepage through the dam and at the toe of the dam should be investigated further to determine its origin and monitored to determine any changes.
- b. Structural stability of the embankment and the granite block face should be analyzed, monitored and repaired.
- c. Prepare a detailed hydraulic/hydrologic study to determine spillway adequacy and an increase of the total project discharge if necessary.

### 7.3 Remedial Measures

- a. Operation and Maintenance Procedures -
  - (1) Downstream of the spillway channel should be cleared of debris.

(2) Vegetation on the downstream face of the dam and trees along the toe of the dam should be removed. This will facilitate the visual observation of existing and potential seepage. Grass on the top of the dam should be mowed periodically.

(3) Slide gate should be repaired.

(4) Plans for a regular program of operation and maintenance of the dam should be initiated.

(5) Plans for around-the-clock surveillance should be developed for periods of unusually heavy rains and a formal downstream warning system should be put into operation for use in the event of an emergency.

(6) A program of annual technical inspection should be established.

#### 7.4 Alternatives

None

**APPENDIX A**

**INSPECTION CHECK LIST**

# INSPECTION CHECK LIST

## PARTY ORGANIZATION

PROJECT MERCERS POND DAM

DATE 4/22/80

TIME 12:30 p.m.

WEATHER Clear

W.S. ELEV. \_\_\_\_\_ U.S. \_\_\_\_\_ DN.S. \_\_\_\_\_

### PARTY:

- |  |                                   |
|--|-----------------------------------|
| 1. <u>John F. Schearer, SE Civil</u>     | 6. <u>John Pozzato, MA, Mech.</u> |
| 2. <u>Kenneth J. Pudeler, SE Civil</u>   | 7. _____                          |
| 3. <u>Gary J. Giroux, SE Hyd/Civil</u>   | 8. _____                          |
| 4. <u>Michael Haire, DBA Struct/Geo.</u> | 9. _____                          |
| 5. <u>Peter Austin, DBA Civil</u>        | 10. _____                         |

PROJECT FEATURE	INSPECTED BY	REMARKS
1. _____		
2. _____		
3. _____		
4. _____		
5. _____		
6. _____		
7. _____		
8. _____		
9. _____		
10. _____		

# INSPECTION CHECK LIST

PROJECT MERCERS POND DAM DATE 4/22/80  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITIONS
<u>DAM EMBANKMENT</u>	
Crest Elevation	Good
Current Pool Elevation	Good
Maximum Impoundment to Date	Good
Surface Cracks	N/A
Pavement Condition	N/A
Movement or Settlement of Crest	None
Lateral Movement	Bulge in stone west of center
Vertical Alignment	Good
Horizontal Alignment	Good
Condition at Abutment and at Concrete Structures	Good
Indications of Movement of Structural Items on Slopes	N/A
Trespassing on Slopes	Problem
Vegetation on Slopes	Some - well maintained
Sloughing or Erosion of Slopes or Abutments	Stone piled at west end - not clear if it was a failure or piled intentionally
Rock Slope Protection - Riprap Failures	None
Unusual Movement or Cracking at or near Toes	None
Unusual Embankment or Downstream Seepage	Seasonal seepage at toe
Piping or Boils	None
Foundation Drainage Features	None
Toe Drains	None
Instrumentation System	None

# INSPECTION CHECK LIST

PROJECT MERCERS POND DAM

DATE 4/22/80

PROJECT FEATURE \_\_\_\_\_

NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_

NAME \_\_\_\_\_

## AREA EVALUATED

## CONDITION

### CUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE

#### a. Approach Channel

Underwater

Slope Conditions

Bottom Conditions

Rock Slides or Falls

Log Boom

Debris

Condition of Concrete Lining

Drains or Weep Holes

#### b. Intake Structure

Condition of Concrete

Good

Stop Logs and Slots

None

# INSPECTION CHECK LIST

PROJECT MERCERS POND DAM

DATE 4/22/80

PROJECT FEATURE \_\_\_\_\_

NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_

NAME \_\_\_\_\_

## AREA EVALUATED

## CONDITION

### OUTLET WORKS - CONTROL TOWER

#### a. Concrete and Structural

General Condition

Condition of Joints

Spalling

Visible Reinforcing

Rusting or Staining of Concrete

Any Seepage or Efflorescence

Joint Alignment

Unusual Seepage or Leaks in Gate Chamber

Cracks

Rusting or Corrosion of Steel

#### b. Mechanical and Electrical

Air Vents

Float Wells

Crane Hoist

Elevator

Hydraulic System

Service Gates

Emergency Gates

Lightning Protection System

Emergency Power System

Wiring and Lighting System in Gate Chamber

None

# INSPECTION CHECK LIST

PROJECT MERCERS POND DAM

DATE 4/22/80

PROJECT FEATURE \_\_\_\_\_

NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_

NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<p><u>OUTLET WORKS - TRANSITION AND CONDUIT</u></p> <p>General Condition of Concrete</p> <p>Rust or Staining on Concrete</p> <p>Spalling</p> <p>Erosion or Cavitation</p> <p>Cracking</p> <p>Alignment of Monoliths</p> <p>Alignment of Joints</p> <p>Numbering of Monoliths</p>	<p>24" R.C. pipe - good condition controlled by a slide gate - stuck in the closed position.</p>

## INSPECTION CHECK LIST

**PROJECT** MERCERS POND DAM

DATE 4/22/80

**PROJECT FEATURE**

**NAME** \_\_\_\_\_

**DISCIPLINE**

**NAME** \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL</u>	None
General Condition of Concrete	
Rust or Staining	
Spalling	
Erosion or Cavitation	
Visible Reinforcing	
Any Seepage or Efflorescence	
Condition at Joints	
Drain holes	
Channel	
Loose Rock or Trees Overhanging Channel	Some
Condition of Discharge Channel	Good

# INSPECTION CHECK LIST

PROJECT MERCERS POND DAM DATE 4/22/80

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u>	
a. Approach Channel	Underwater
General Condition	
Loose Rock Overhanging Channel	
Trees Overhanging Channel	
Floor of Approach Channel	
b. Weir and Training Walls	Weir - good condition. Walls-poor (just stacked stones and conc. blocks-some undermining)
General Condition of Concrete	GOOD
Rust or Staining	None
Spalling	None
Any Visible Reinforcing	None
Any Seepage or Efflorescence	None
Drain Holes	None
c. Discharge Channel	
General Condition	Good
Loose Rock Overhanging Channel	Some
Trees Overhanging Channel	Some
Floor of Channel	Rocky (natural) - good
Other Obstructions	Some large boulders

# INSPECTION CHECK LIST

PROJECT MERCERS POND DAM

DATE 4/22/80

PROJECT FEATURE \_\_\_\_\_

NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_

NAME \_\_\_\_\_

## AREA EVALUATED

## CONDITION

### OUTLET WORKS - SERVICE BRIDGE

N/A

#### a. Super Structure

Bearings

Anchor Bolts

Bridge Seat

Longitudinal Members

Under Side of Deck

Secondary Bracing

Deck

Drainage System

Railings

Expansion Joints

Paint

#### b. Abutment & Piers

General Condition of Concrete

Alignment of Abutment

Approach to Bridge

Condition of Seat & Backwall

## APPENDIX B

### ENGINEERING DATA

Information pertaining to the history, maintenance and past inspection reports are located at:

State of Connecticut  
Department of Environmental Protection  
Water Resources Unit  
State Office Building  
Hartford, Connecticut 06115

# MACCHI ENGINEERS

EXECUTIVE OFFICES

44 GILLETT STREET

HARTFORD, CONN., 06105

PHONE (203) 549-6190

A. J. MACCHI, P.E.  
JOSE H. COSIO, P.E.  
MICHAEL GIRARD, P.E.

ASSOCIATE CONSULTANT  
PROF. C. W. DUNHAM

WATER & RELATED  
RESOURCES  
RECEIVED

JUN 2 1975

June 2, 1975

ANSWERED \_\_\_\_\_  
REFERRED \_\_\_\_\_  
FILED \_\_\_\_\_

Mr. Victor F. Galgowski  
Supt. of Dam Maintenance  
Water and Related Resources  
Dept. of Environmental Protection  
165 Capitol Avenue  
Hartford, Conn. 06115

Re: Mercers Pond Dam, Danbury

Dear Mr. Galgowski:

Pursuant to our telephone conversation and your follow up letter, dated May 27, 1975, we are submitting the enclosed inspection report for the above-referenced dam.

If you have any questions, please call.

Very truly yours,

MACCHI ENGINEERS

  
A. J. MACCHI, P.E.

Encl.

MERCERS POND DAM  
DANBURY, CONNECTICUT

INSPECTION REPORT

FOR THE

STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION  
WATER AND RELATED RESOURCES

BY

MACCHI ENGINEERS  
HARTFORD, CONNECTICUT

MAY, 1975

## MERCERS POND DAM, DANBURY, CONNECTICUT

### INTRODUCTION

Mercers Pond Dam is located in the North-West section of Danbury and is owned by the family of Frederick L. Adler, residing adjacent to the dam at 6 Franklin Street Extension, Danbury, Connecticut.

Mr. A. J. Macchi, P.E. and Josef Womelsdorf of Macchi Engineers inspected the dam and site on May 28, 1975. The request for this safety inspection was made by Mr. Victor F. Galgowski, Superintendent of Dam Maintenance for the State Department of Environmental Protection. Mrs. Adler provided certain information on the history of the dam.

The area of Mercers Pond Dam is approximately five (5) acres. Outflow on May 28, 1975 was estimated to be less than one (1) cfs.

### DESCRIPTION

1. The dam is a massive granite block masonry structure with open joints topped with shallow soil, grass and brush growth about 3 ft. high. It is approximately 250 ft. long in East-West direction with a 150 ft. return at the East side. The maximum height is 17+ ft. The spillway is located at the West end of the dam. (See plan and sections included with this report.)
2. No seepage of leakage was observed. There was no indication of any displacement of the granite blocks.
3. Mrs. Adler stated that the dam overtopped during the 1955 flood near the easterly end, where a landing platform is now located. This is still the low point of the dam, extending to 3.5+ ft. above the spillway, compared to 4 ft. adjacent to the spillway and 5 ft. at the east side.
4. Mrs. Adler stated that the spillway was lowered about 3 ft. as directed by the State three years ago. Mrs. Adler now is interested to install fail safe flashboards to raise the pond elevation and to eliminate the undesirable marsh condition at the upstream end of the pond.
5. The present spillway which is 39 ft. wide is formed by a 16" concrete cut-off wall backfilled with 200 - 500 lb. riprap at the downstream side, flanked by open joint masonry on the east side and a natural, steep embankment on the west side. The concrete endwalls are minimum 3.5 ft. high. The downstream channel contracts to a width of about 20 ft. and a depth of about 5 ft. The slope is approximately 10%.

6. An upstream box culvert at Middle River Road is 3.5 ft. high and 10 ft. wide. Two hundred yards downstream, the structure under Franklin Street is a masonry arch, approximately 12 ft. wide and 8 ft. high.

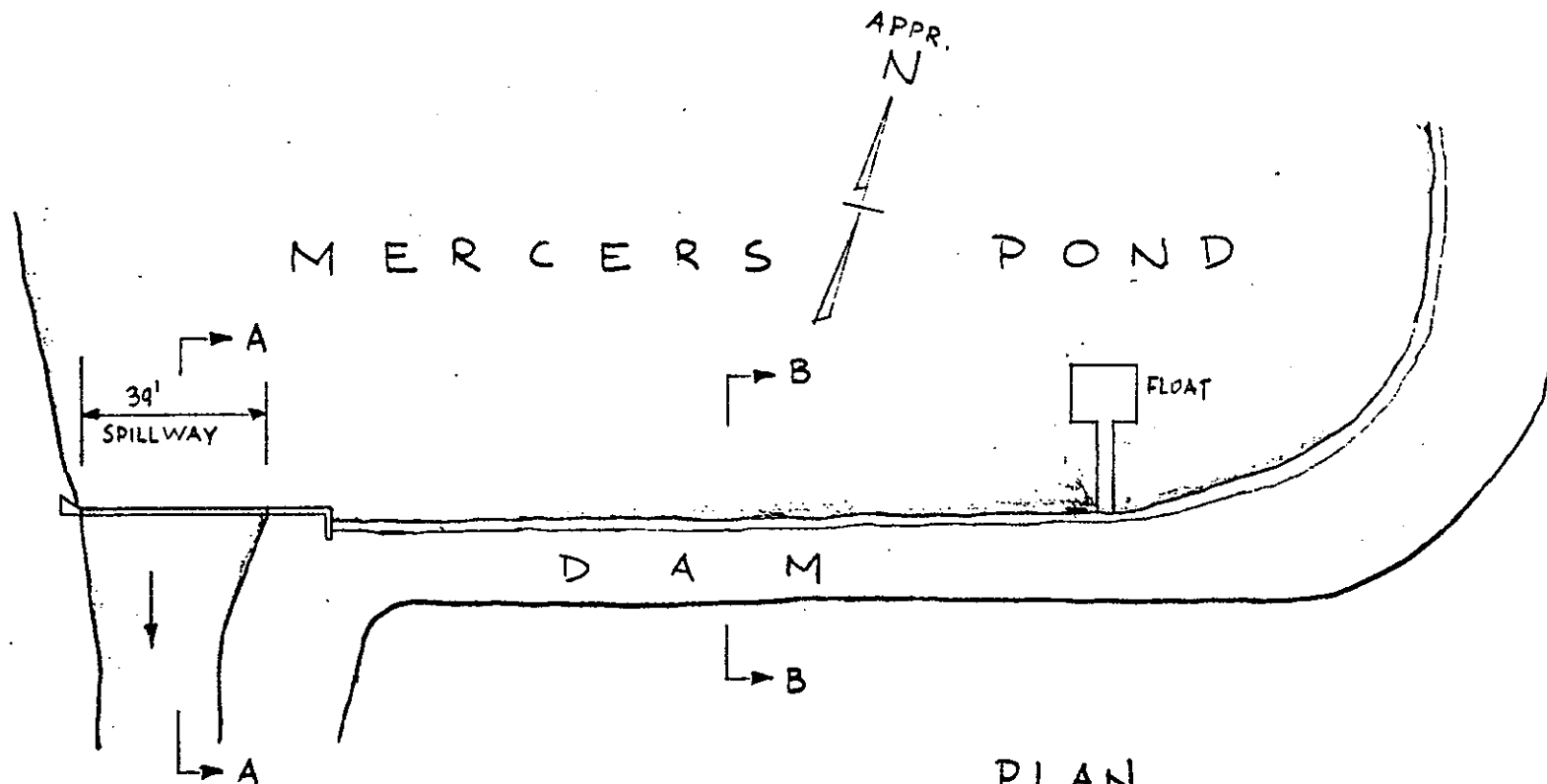
The direct drainage area of Mercers Pond is approximately 700 acres. However, outflow from upstream West Lake Reservoir, owned by the City of Danbury, drains into Mercers Pond.

#### SUMMARY

1. The granite block dam structure is in good condition.
2. The spillway and downstream channel are in good condition.
3. The new spillway capacity should prevent future overtopping.
4. A hydraulic analysis of possible effects from the West Lake Reservoir is outside the scope of this report.

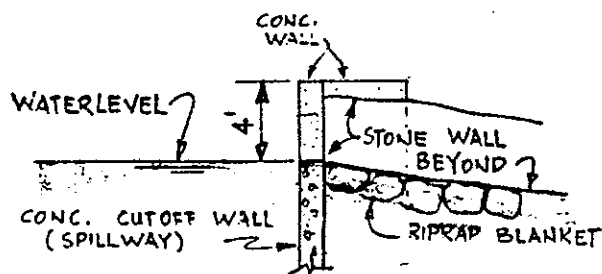
#### RECOMMENDATIONS

1. The brush growth within the dam area should be cut during the next two years.
2. The recently reconstructed downstream channel should be checked in three to four years for erosion.



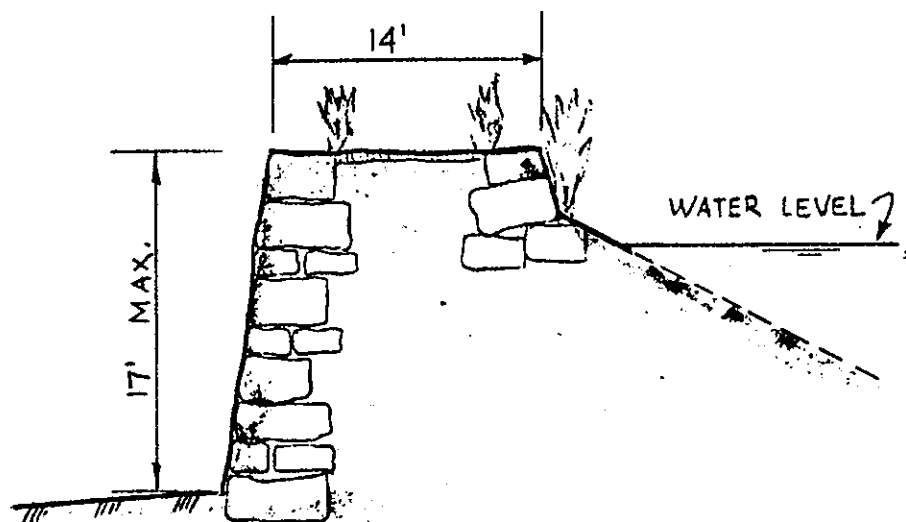
PLAN

SCALE: 1" = 40'



SECTION A-A

SCALE: 1" = 10'



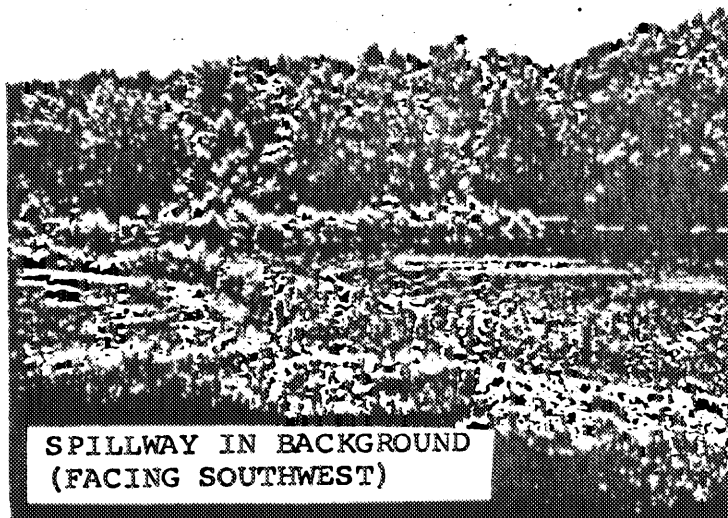
SECTION B-B

SCALE: 1" = 10'

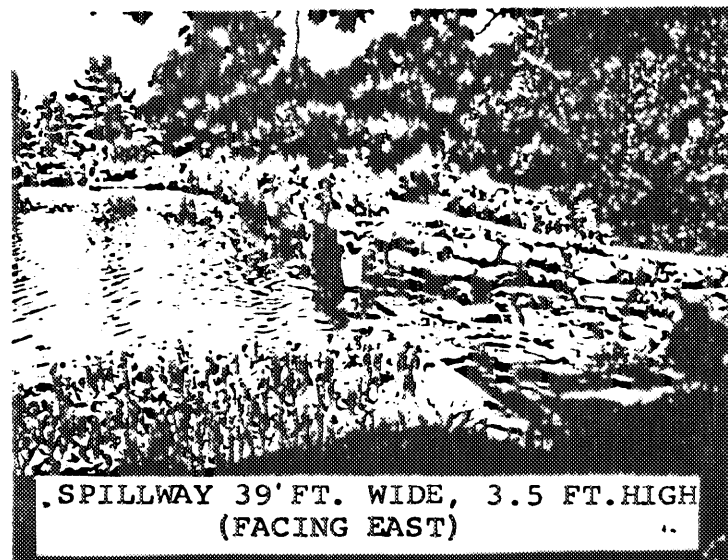
BY J.W. DATE 5-30-75  
CHKD. BY A.L.M. DATE 6-2-75

SUBJECT MERCERS POND  
DANBURY, CONN.

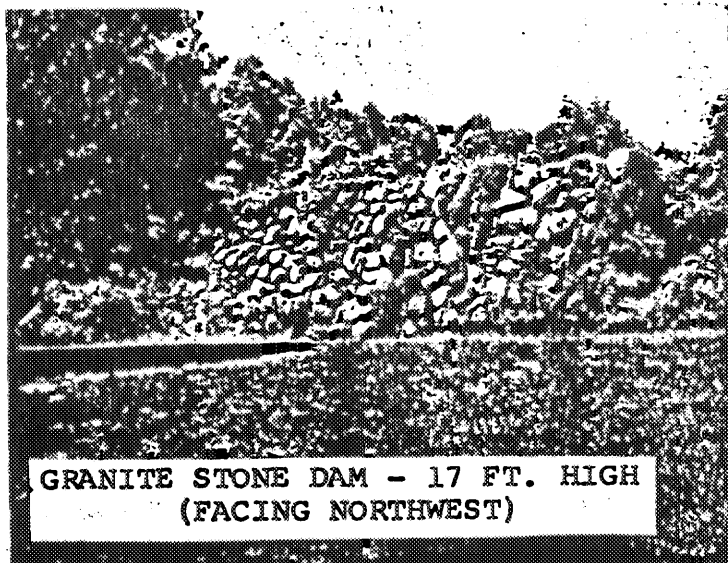
SHEET NO. 3 OF 3  
JOB NO.



SPILLWAY IN BACKGROUND  
(FACING SOUTHWEST)



SPILLWAY 39' FT. WIDE, 3.5 FT. HIGH  
(FACING EAST)



GRANITE STONE DAM - 17 FT. HIGH  
(FACING NORTHWEST)

MERCERS POND DAM  
DANBURY, CONNECTICUT  
MAY 28, 1975

# CLARENCE BLAIR ASSOCIATES

ROGER C. BROWN  
JAMES C. BEACH  
FRANK RAGAINI

CLARENCE M. BLAIR  
(1904-1944)

*Civil and Sanitary Engineers*  
93 WHITNEY AVENUE  
P. O. BOX 236  
NEW HAVEN, CONNECTICUT 06502  
TEL 777-7379

CHARLES E. AUGUR, JR.  
JOHN M. BREST  
DONALD L. DISBROW  
NICHOLAS PIPERAS, JR.

February 17, 1966

State of Connecticut  
Water Resources Commission  
State Office Building  
Hartford 15, Connecticut

Re: MERCERS POND DAM  
DANBURY, CONNECTICUT

STATE WATER RESOURCES COMMISSION RECEIVED	
FEB 21 1966	
ANSWERED	_____
REFERRED	_____
FILED	_____

Gentlemen:

Herewith is my report on Mercers Pond Dam in Danbury, Connecticut.

## 1. IDENTIFICATION

This report was made at the request of Mr. William P. Sander in a letter dated May 7, 1965.

A survey of the dam was made on July 6, 1965.

An inspection was made by the writer and an assistant engineer on October 21, 1965.

The dam is located on a tributary of Padanaram Brook in the northwesterly section of Danbury about 500 feet westerly of Franklin Street.

Latitude 41-24-05

Longitude 73-28-35

The owner of record is Westover Center, Inc., P.O. Box 507, Danbury, Connecticut.

## 2. FACTORS OF HAZARD

Serious property damage and possible loss of life would take place about 700 feet downstream if the dam failed either during a flood or during ordinary flows.

At this point, 700 feet downstream, a convalescent home is located directly on the bank of the brook. A major flood or a giving away of the dam

February 17, 1966

probably would result in serious property damage and possible loss of life.

The dam in my opinion is a structure which by breaking away would endanger life.

### 3. STRUCTURE

Mercers Pond Dam is approximately 500 feet long with a maximum height of about 20 feet.

The main portion of the dam is 250 feet long in a straight line, approximately at a right angle with the valley. The remaining 250 feet of the dam consists of an earth embankment curving in an upstream direction.

The main portion of the dam consists of an earth embankment against a stone retaining wall on the downstream face. A typical section through this part of the dam has a top width of 13 feet including 3 feet of top width of the retaining wall. The upstream slope of the embankment is about 1 vertical on 2 horizontal below the water line and steeper above the water line. There is some rough riprap visible above and at the water line. The top of the dam is well sodded and has bushes and a few trees growing from it.

The downstream retaining wall has a batter of 3 feet in 17 feet of height. It is of dry masonry of good substantial stones and is in fair condition but several of the cap stones are missing from the top.

No information was available as to foundation conditions. Indications were that the westerly end of the dam in the vicinity of the spillway may be on rock foundation.

The spillway is at the westerly end of the dam. The present overflow weir is a concrete wall 15 inches wide. Indications are that the original spillway was 41.5 feet wide and 3.5 to 4.0 feet deep. The new concrete overflow wall across the spillway has a notch 39 feet long and 1.2 feet below its abutments.

A profile along the top of the dam shows several points which are only 1.1 feet above the overflow weir. The higher portions of the main dam are only 1.5 feet above the overflow.

At a stage of 1.1 feet water would begin to flow over the top of the dam in several places.

At a stage of 1.5 feet water would begin to go over practically the entire 250 foot length of the main dam.

The concrete wall forming the present overflow weir is 2.9 feet high on the downstream side above a concrete apron, and 4.4 feet high on the

Water Resources Commission  
Mercers Pond Dam, Danbury, Connecticut

February 17, 1966

upstream side. The whole wall is in good condition and comparatively new. It apparently has been built across the old spillway to raise the water level in the pond. The existing spillway, at a stage of 1.1 feet, the height at which flow over the dam would take place, is estimated to have a capacity of 151 cfs.

Due to the construction of the dam with the masonry retaining wall forming the downstream face, the dam can take some overtopping without damage. However the fact that some of the cap stones are missing makes the top of the wall uneven and would tend to concentrate overflow at the low points causing erosion gulleys across the top of the embankment.

Some slight seepage was observed at the bottom of the dam at its highest point.

The stone retaining wall was in good condition except for the missing stones along the top as previously mentioned.

#### 4. HYDROLOGY

The total drainage area tributary to Mercers Pond is 4.37 square miles.

On this watershed is West Lake Reservoir, a water supply reservoir for the City of Danbury. This is a large reservoir with a capacity of 1.6 billion gallons and a surface area of 218 acres. The dam at West Lake is about 1.5 miles upstream from the dam at Mercers Pond. The drainage area tributary to West Lake is 3.26 square miles, leaving the direct, uncontrolled drainage area at Mercers Pond at 1.11 square miles.

A hypothetical storm having a rainfall of 6 inches in 24 hours, based on rainfall recorded on September 20-21, 1938 (the 1938 hurricane storm) was used to develop a runoff hydrograph. Peak inflow for West Lake was estimated to be 777 cfs and peak outflow 400 cfs.

The peak inflow at Mercers Pond was estimated to be 175 cfs from the 1.11 square miles of drainage area below West Lake plus the 400 cfs peak outflow from West Lake. Since the storage in Mercers Pond is not significant, the outflow should equal the inflow for a total peak outflow of 575 cfs.

As we previously stated the existing spillway has a capacity of 151 cfs before over topping the dam. A discharge of 575 cfs would produce a stage of 2.7 feet with the dam being overtopped by 1.6 feet in places.

#### 5. SAFETY

In my opinion the dam is unsafe at the present time because of inadequate spillway capacity. The unsafe condition is serious since

Water Resources Commission  
Mercers Pond Dam, Danbury, Connecticut

February 17, 1966

the existing spillway capacity is only about 26% of our design discharge. The dam is likely to fail from a flood runoff which would overtop the dam, erode gulleys in the embankment and cause failure of the masonry wall.

The dam should have periodic inspection until the lack of adequate freeboard is corrected.

## 6. REQUIREMENTS

In my opinion it is necessary to cut down the concrete spillway wall by at least 2.5 feet for its entire length of 39 feet. This would provide a freeboard of 3.6 feet to the low spots in the embankment. The design discharge of 575 cfs would produce a stage of 2.7 feet and leave a freeboard of 0.9 feet.

It would be practical to complete this work this summer after the spring runoff is over.

Although it is not absolutely necessary at this time it would be advisable to cut all trees growing from the embankment, to eliminate the possibility of their being uprooted in a high wind, thereby causing a breach in the dam.

## 7. SUMMARY OF FACTS:

Mercers Pond Dam is located about 700 feet upstream from a convalescent home which borders directly on the brook. A giving away of the dam or a major flood would cause serious damage and possible loss of life at the convalescent home.

The dam is about 500 feet long with a maximum height of 20 feet. The typical section consists of earth embankment against a stone retaining wall forming the downstream face. The embankment and wall are in fair condition.

The original spillway has been rebuilt by the construction of a concrete wall across the original spillway notch. This wall forms a new overflow spillway, 39 feet long with a freeboard of 1.1 feet to low spots in the top of the embankment.

The drainage area tributary to Mercers Pond is 4.37 square miles. A large part of this drainage area (3.26 square miles) is tributary to West Lake, a large storage reservoir of the Danbury Water Department.

A hypothetical storm based on the 1938 hurricane rainfall was estimated to produce a peak outflow at Mercers Pond Dam of 575 cfs. This discharge would produce a stage which would over top the dam by 1.6 feet in several places.

Water Resources Commission  
Mercers Pond Dam, Danbury, Connecticut

February 17, 1966

## 8. CONCLUSION

In my opinion this dam is unsafe at the present time because of the definitely inadequate spillway capacity. The dam is likely to fail because of a flood runoff overtopping the earth embankment. I believe it is necessary to increase the spillway capacity by lowering the overflow weir 2.5 feet below its present level.

## 9. RECOMMENDATION

I recommend that an order be issued to have the overflow weir be lowered by 2.5 feet. In view of the hazard downstream, this action should be taken as soon as practical. I would suggest that this be accomplished before the 1966 hurricane season.

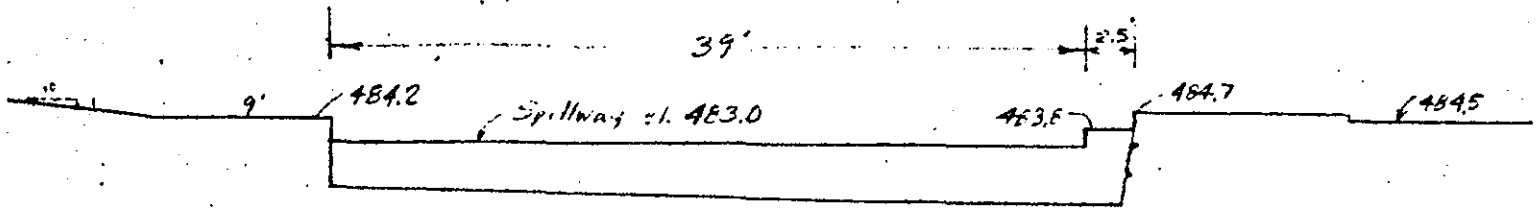
Respectfully submitted



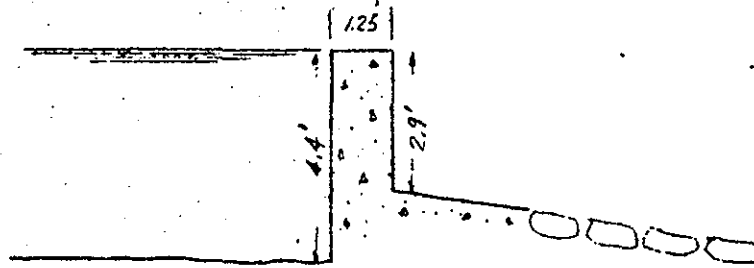
Roger C. Brown  
Committing Engineer

RCB:mc

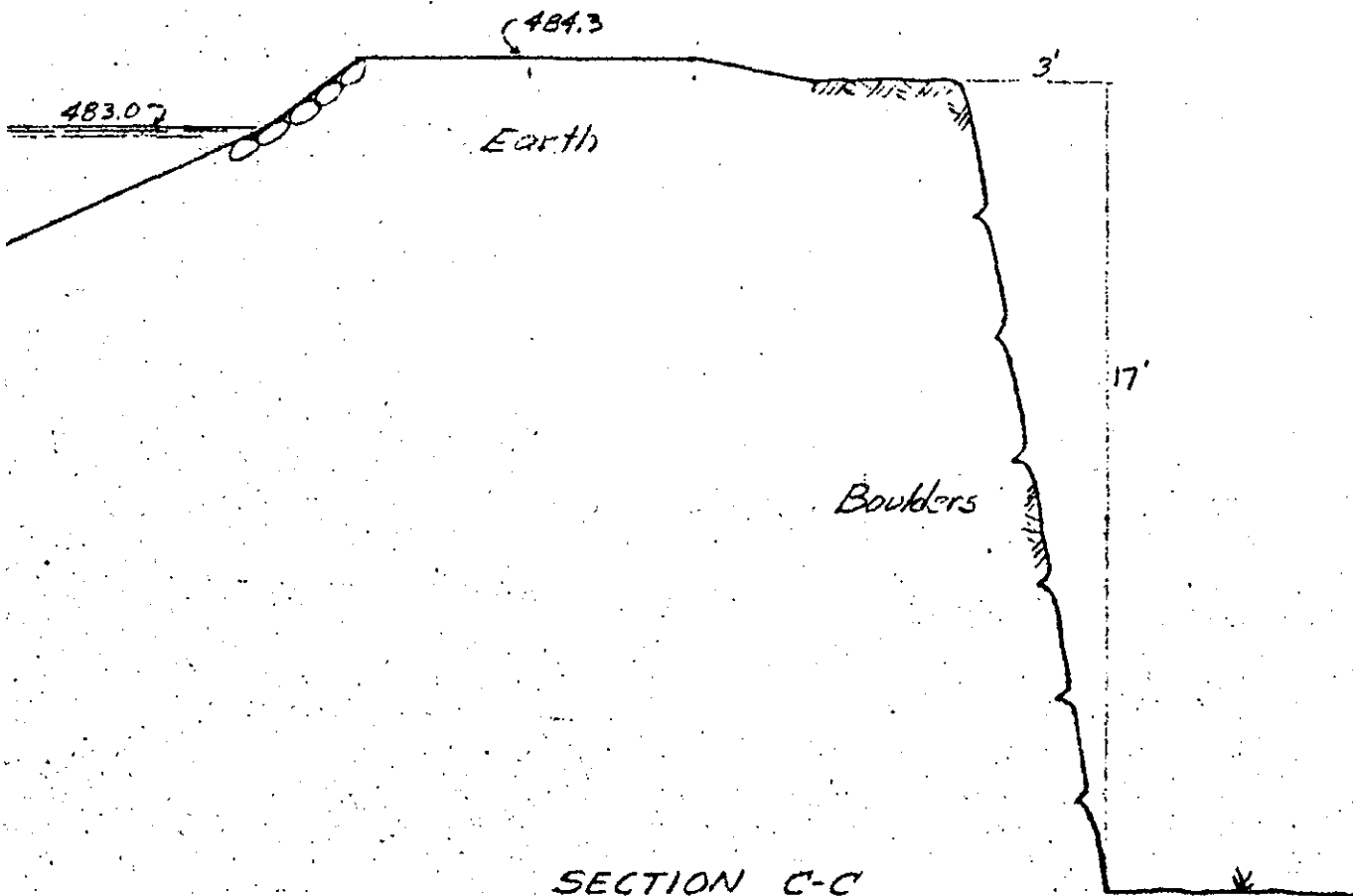




SECTION A-A  
1" = 10'

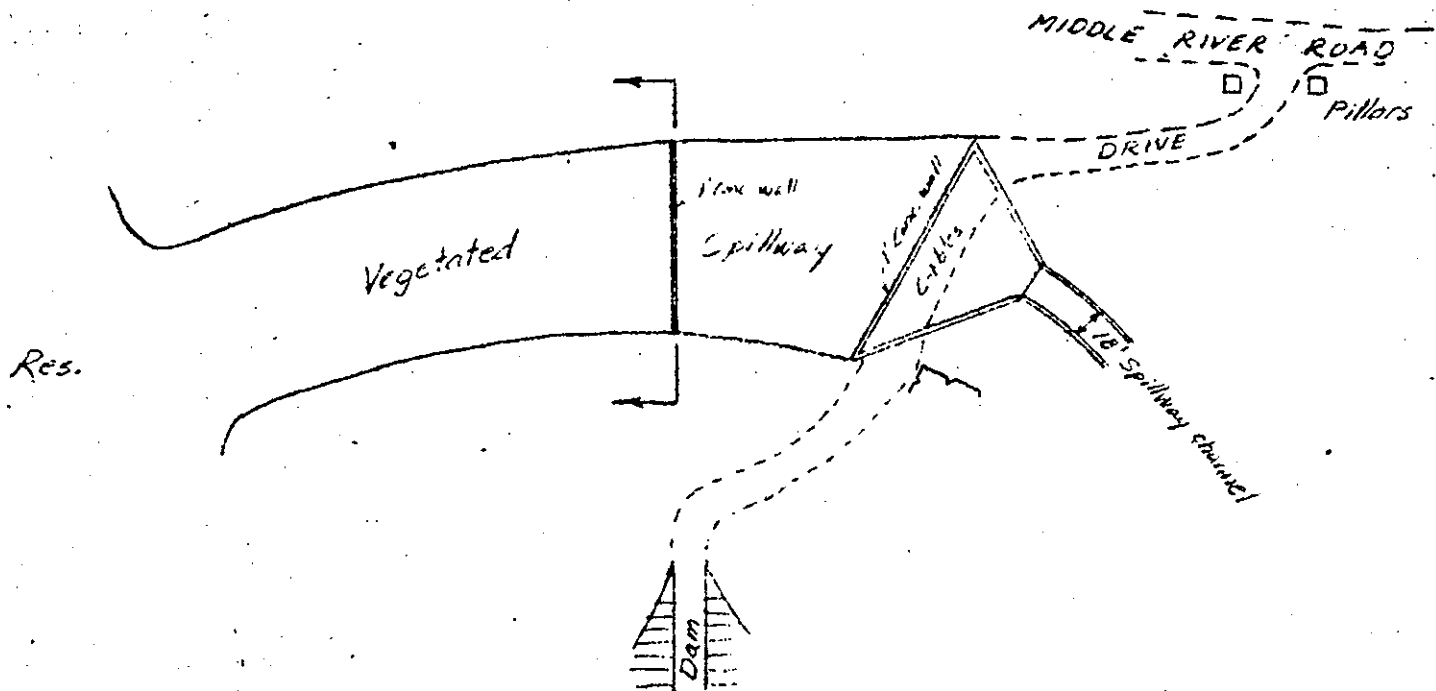


SECTION B-B  
1" = 4'

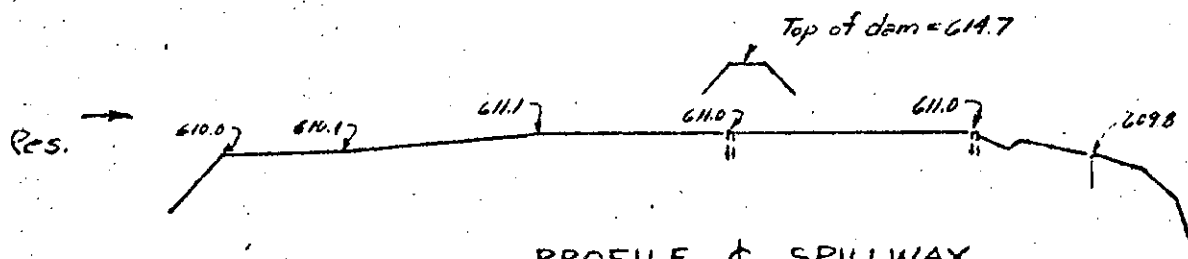


SECTION C-C  
1" = 4'

# WEST LAKE RESERVOIR - SPILLWAY DANBURY, CONN.

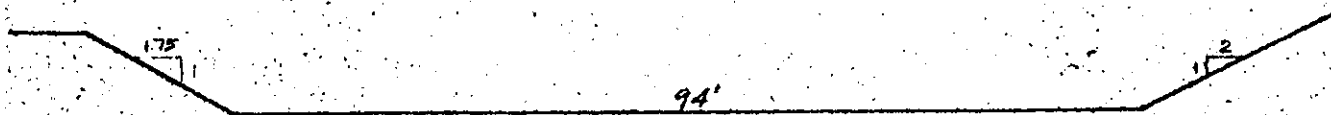


SKETCH OF SPILLWAY



PROFILE OF SPILLWAY

Hor. 1" = 100'  
Vert. 1" = 10'



CROSS SECTION OF SPILLWAY

1" = 20'

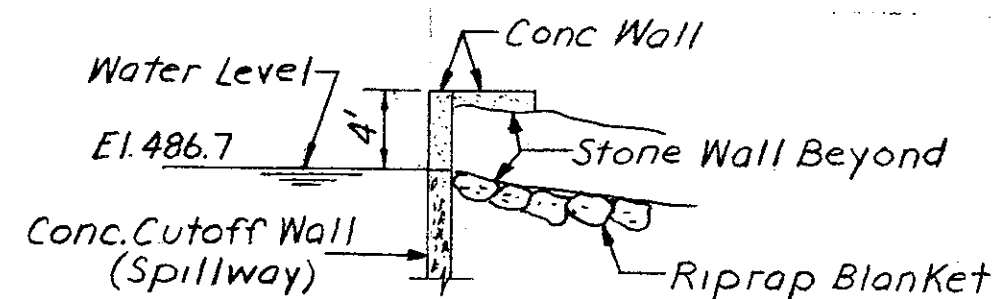
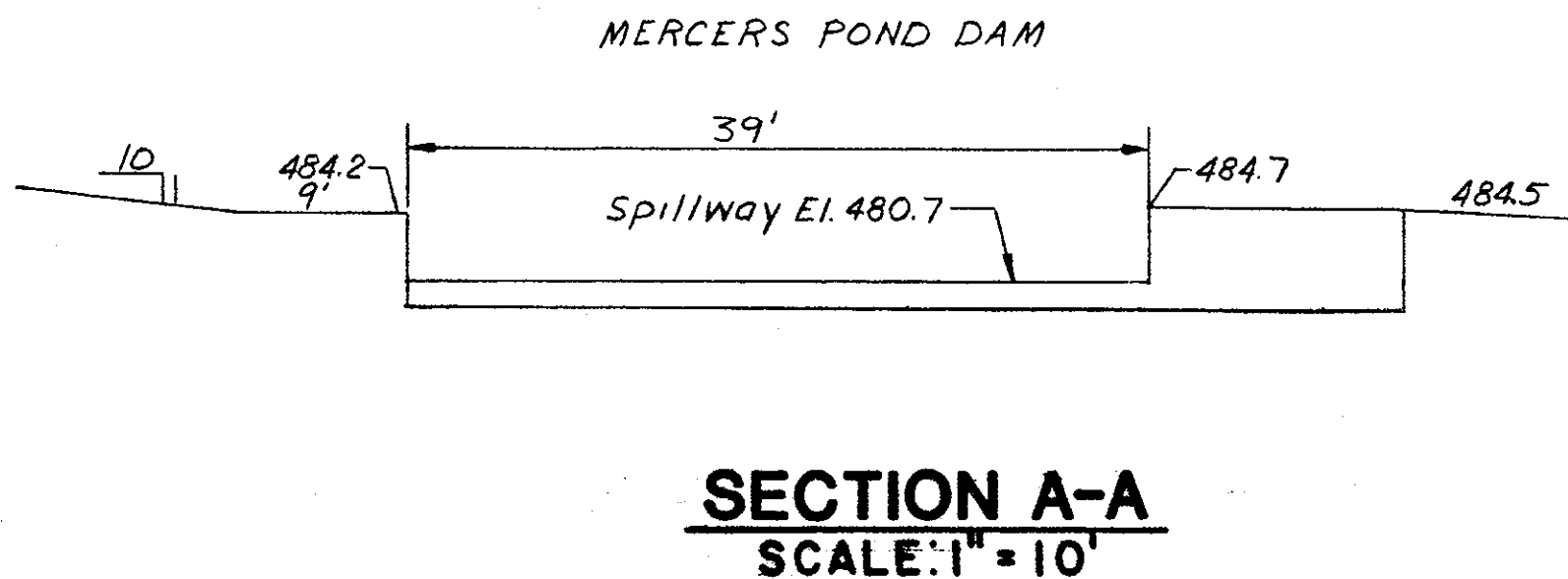
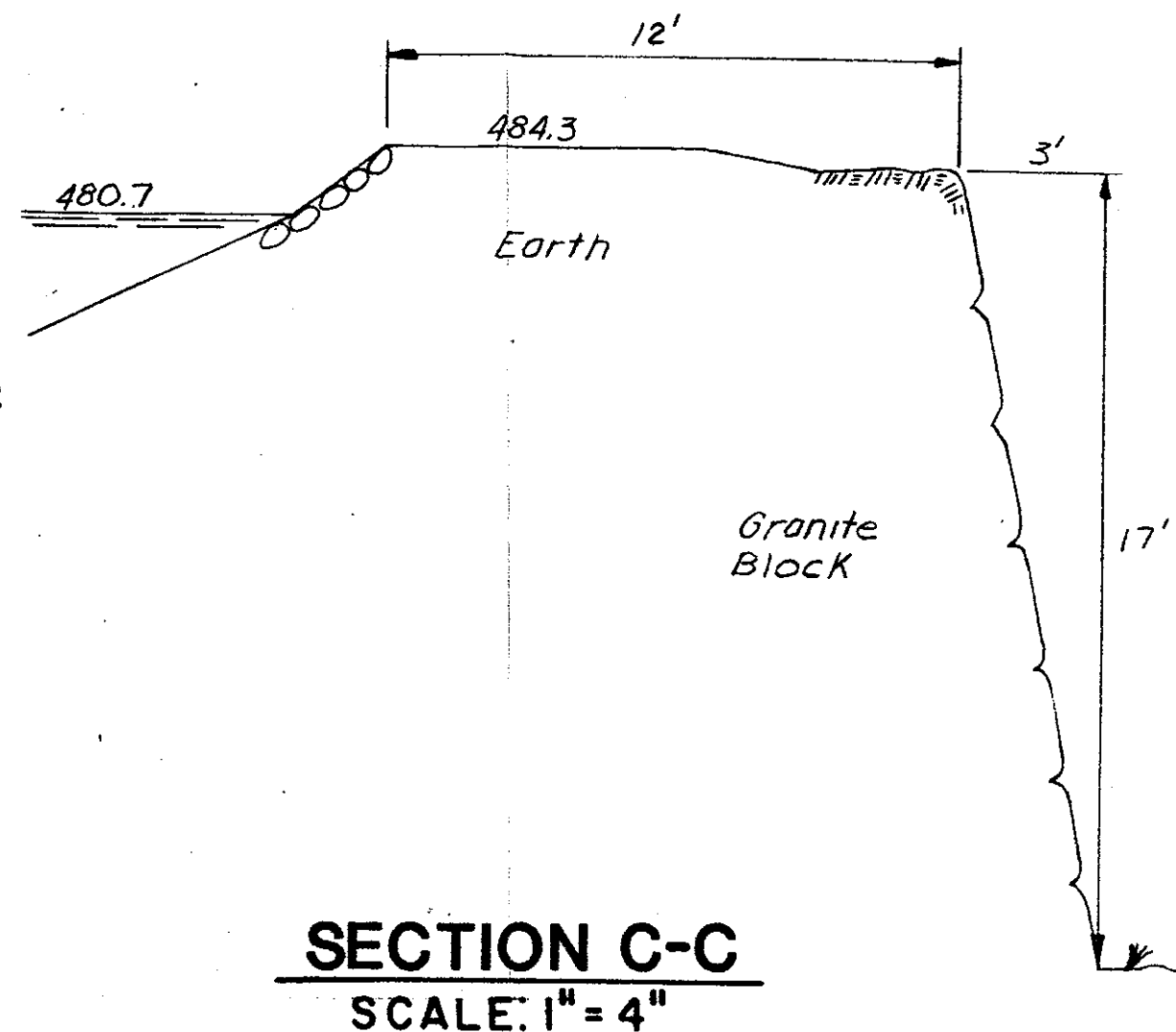
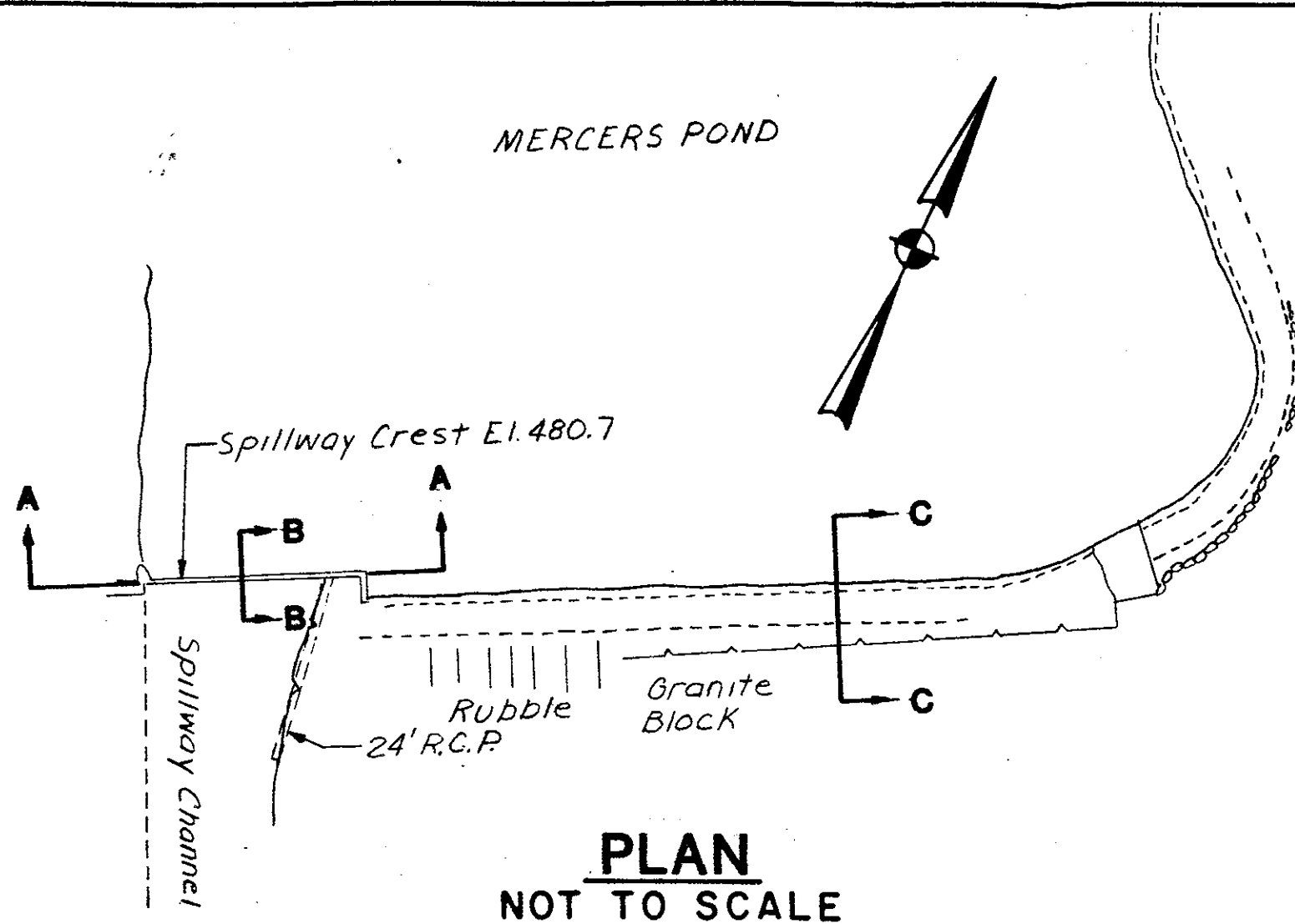


PLATE 1

STORCH ENGINEERS  
WETHERSFIELD, CONNECTICUT

U.S. ARMY ENGINEER DIV. NEW ENGLAND  
CORPS OF ENGINEERS  
WALTHAM MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

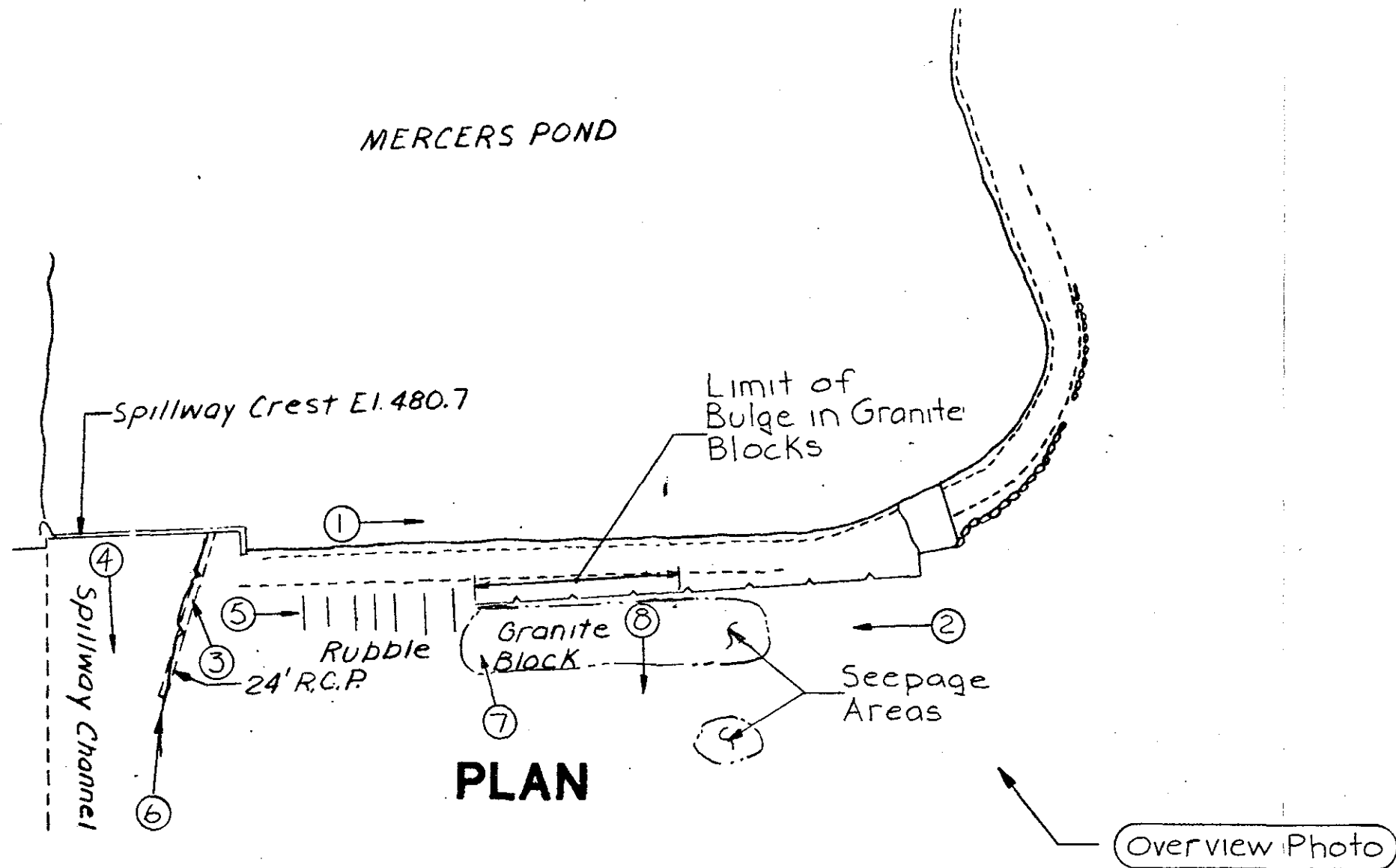
MERCERS POND DAM

SCALE: AS SHOWN

DATE JULY 1980

APPENDIX C

PHOTOGRAPHS



# PHOTO LOCATION PLAN

PLATE 2

STORCH ENGINEERS  
WETHERSFIELD, CONNECTICUT

U.S. ARMY ENGINEER DIV. NEW ENGLAND  
CORPS OF ENGINEERS  
WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

MERCERS POND DAM

NOT TO SCALE

SCALE: AS SHOWN

DATE: JULY 1980



PHOTO 1  
CREST OF DAM



PHOTO 2  
DOWNSTREAM FACE OF DAM



PHOTO 3  
SPILLWAY - UPSTREAM



PHOTO 4  
SPILLWAY CHANNEL - DOWNSTREAM



PHOTO 5

DETERIORATED DOWNSTREAM WALL - WEST SIDE



PHOTO 6

OUTLET

C-III



PHOTO 7  
SEEPAGE NEAR TOE OF DAM



PHOTO 8  
SEEPAGE NEAR TOE OF DAM

## APPENDIX D

### HYDROLOGIC AND HYDRAULIC COMPUTATIONS

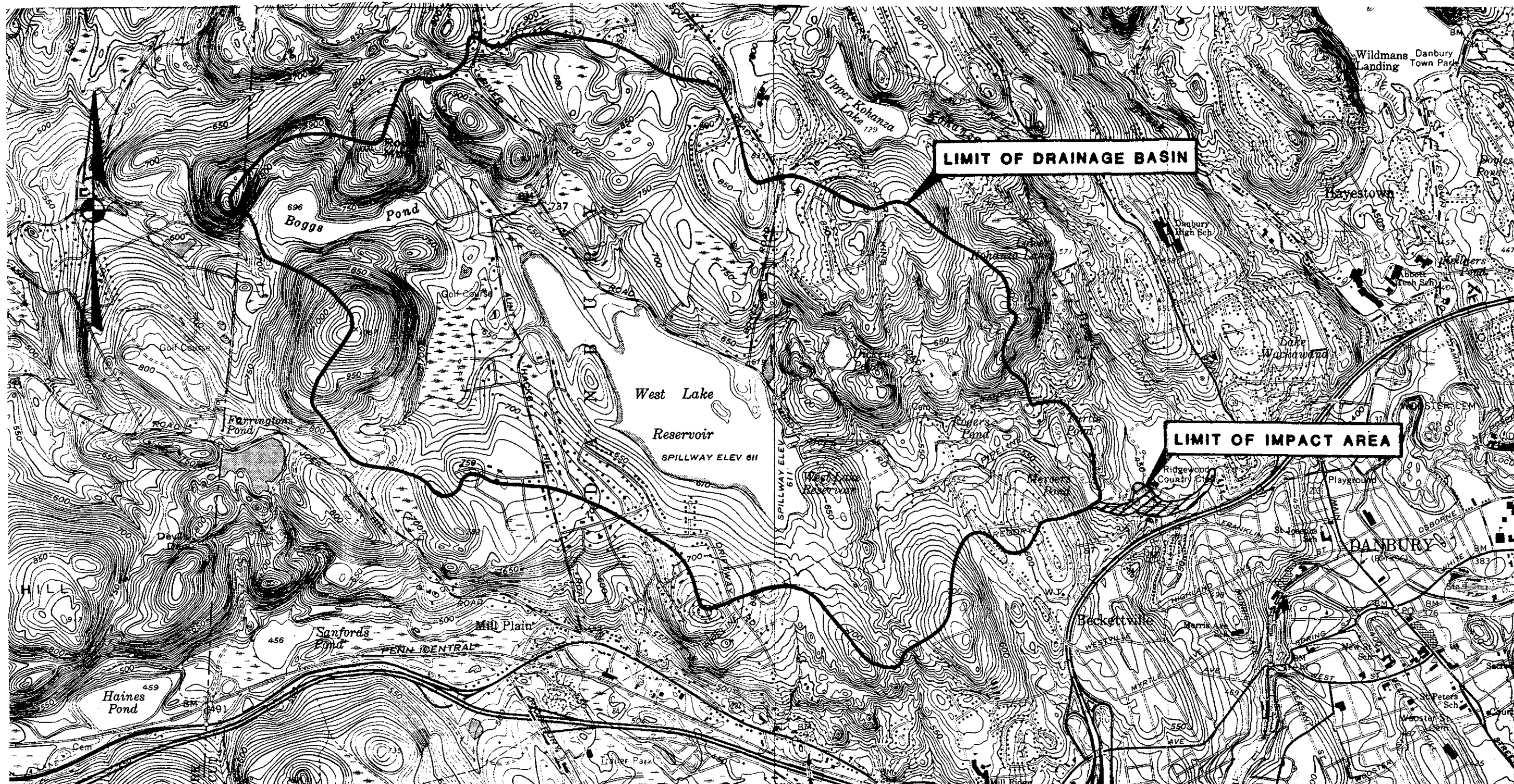


PLATE 3

STORCH ENGINEERS  
WETHERSFIELD, CONNECTICUT

U.S. ARMY ENGINEER DIV. NEW ENGLAND  
CORPS OF ENGINEERS  
WALTHAM MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

MERCERS POND DAM

scale 1:24000

SCALE AS SHOWN  
DATE JULY 1980

**Determination of PMF**

NAME OF DAM Mercers Pond Dam

DRAINAGE AREA 4.5 SM - 3.3 SM Controlled by West Lake Reservoir  
Net DA = 1.2 SM

INFLOW

from West Lake - 3890 cfs  $\frac{1}{2} \text{PMF} = 2230 \text{ cfs}$   
assume that peak from West Lake and peak from independent watershed occur simultaneously.

PMF = 1880 cfs/SM  $\frac{1}{2} \text{PMF} = 940 \text{ cfs/SM}$

PMF = 1880(1.2) + 3890 = 6146 cfs  $\frac{1}{2} \text{PMF} = 940(1.2) + 2230 = 3358 \text{ cfs}$

Estimating the effect of surcharge storage on the Maximum Probable Discharges

1.  $Q_{p1} = \underline{6150} \text{ cfs}$

2a.  $H_1 = \underline{6.4} \text{ (elev.)}$

b.  $\text{STOR}_1 = \underline{0.83''}$

c.  $Q_{p2} = Q_{p1} (1 - \text{STOR}_1/19) = \underline{5881} \text{ cfs}$

3a.  $H_2 = \underline{6.3'}$

$\text{STOR}_2 = \underline{.81''}$

b.  $\text{STOR}_A = \underline{0.82''}$

$Q_{pA} = \underline{5884} \text{ cfs}$

$H_A = \underline{6.35'}$

$\text{STOR}_A = \underline{.82''}$

$\text{PMF} = \underline{5885} \text{ cfs}$

$\frac{1}{2} \text{PMF} = 3240 \text{ cfs}$

$\frac{1}{2} \text{PMF}$   
3360 cfs  
5.5'  
0.7''

3286 cfs  
5.35' .688''

0.69''  
3237 cfs  
5.4' 0.7''

Capacity of the spillway when the pond elevation is at the top of the dam

$Q = \underline{1036} \text{ cfs or } \underline{17.6} \% \text{ of the PMF}$

32 % of  $\frac{1}{2} \text{PMF}$

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JOB Phase I Dam Inspection - #4463

SHEET NO. 2 OF 10  
CALCULATED BY GJG DATE 4/25/80  
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Determination of PMF

NAME OF DAM WEST LAKE RESERVOIR DAM

DRAINAGE AREA 3.3 SM

INFLOW 1975 cfs/sm (rolling terrain)

$$PMF = 1975(3.3) = 6517.5 \text{ cfs}$$

$$\frac{1}{2} PMF = \frac{1}{2} 6517.5 = 3258.75$$

Estimating the effect of surcharge storage on the Maximum Probable Discharges

1.  $Q_{p1} = \underline{6520} \text{ cfs}$

2a.  $H_1 = \underline{5.42'} \text{ (elev.)}$

b.  $STOR_1 = \underline{8.5''}$

c.  $Q_{p2} = Q_{p1} (1 - STOR_1 / 19) = \underline{3600} \text{ cfs}$

3a.  $H_2 = \underline{4.35'}$

$STOR_2 = \underline{6.8''}$

b.  $STOR_A = \underline{7.66''}$

$Q_{PA} = \underline{3890} \text{ cfs}$

$H_A = \underline{4.5'}$

$STOR_A = \underline{7.1''}$

$PMF = \underline{3890} \text{ cfs}$

$\frac{1}{2} PMF$   
3260 cfs

4.2'

6.4''

2160 cfs

3.7' 5.7''

6.0''

2230 cfs

3.75' 6.0''

$\frac{1}{2} PMF = \underline{2230} \text{ cfs}$

Capacity of the spillway when the pond elevation is at the top of the dam

$Q = \underline{1950} \text{ cfs or } \underline{50} \% \text{ of the PMF}$

87.4 % of  $\frac{1}{2} PMF$

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SHEET NO. 3 OF 10

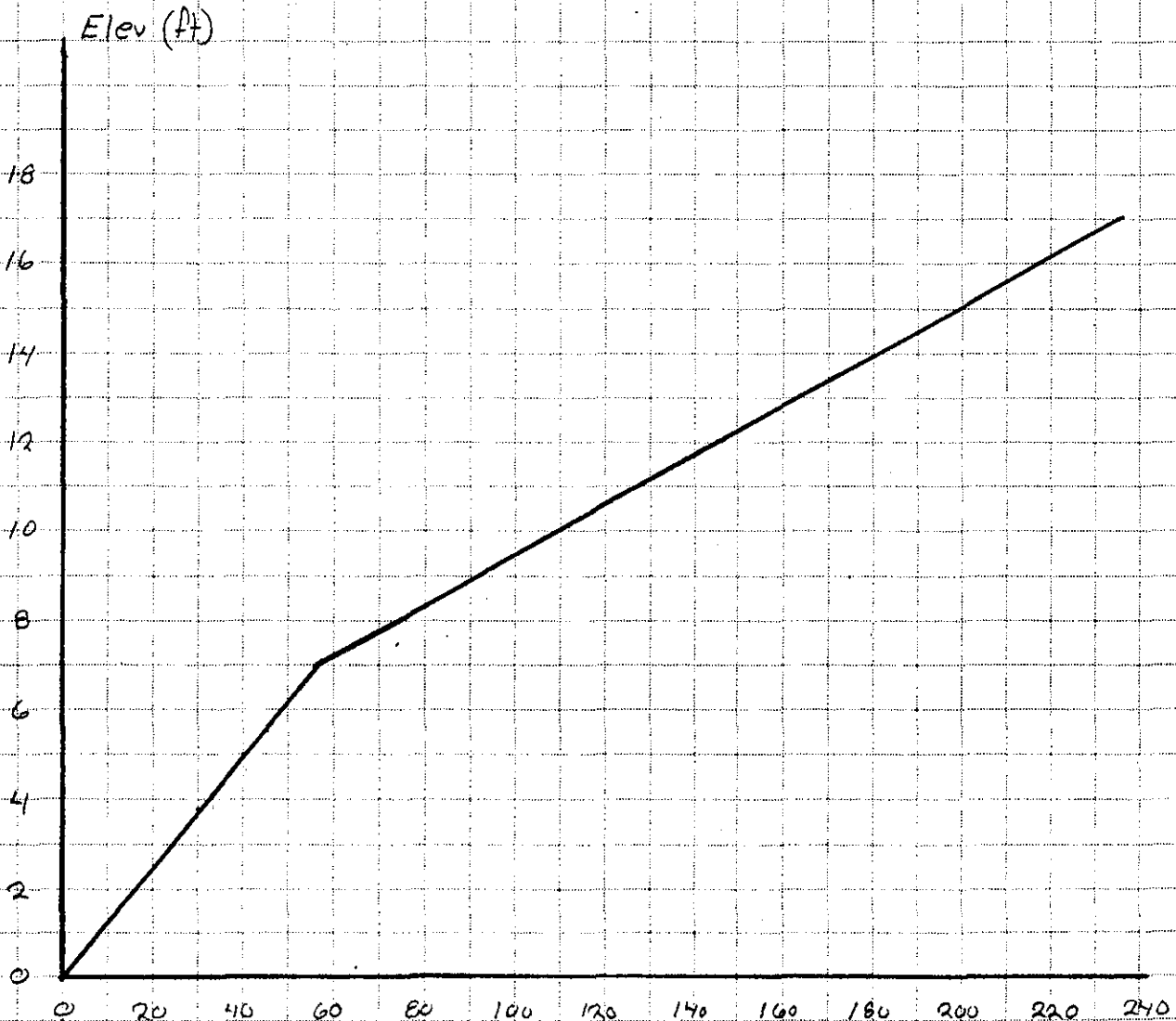
CALCULATED BY GJG DATE 4/16/80

CHECKED BY BOC DATE 7/15/80

**AREA - CAPACITY**

Name of Dam: MERCERS POND DAM

ELEV	DEPTH	AREA	AVG. AREA	VOL	Σ VOL
0.0		6.0			0.0
	7.0		8.1	56.7	
7.0		10.1			56.7
	10.0		17.9	179	
17.0		25.7			236



Capacity (Ac-ft)

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SHEET NO. 41 OF 10

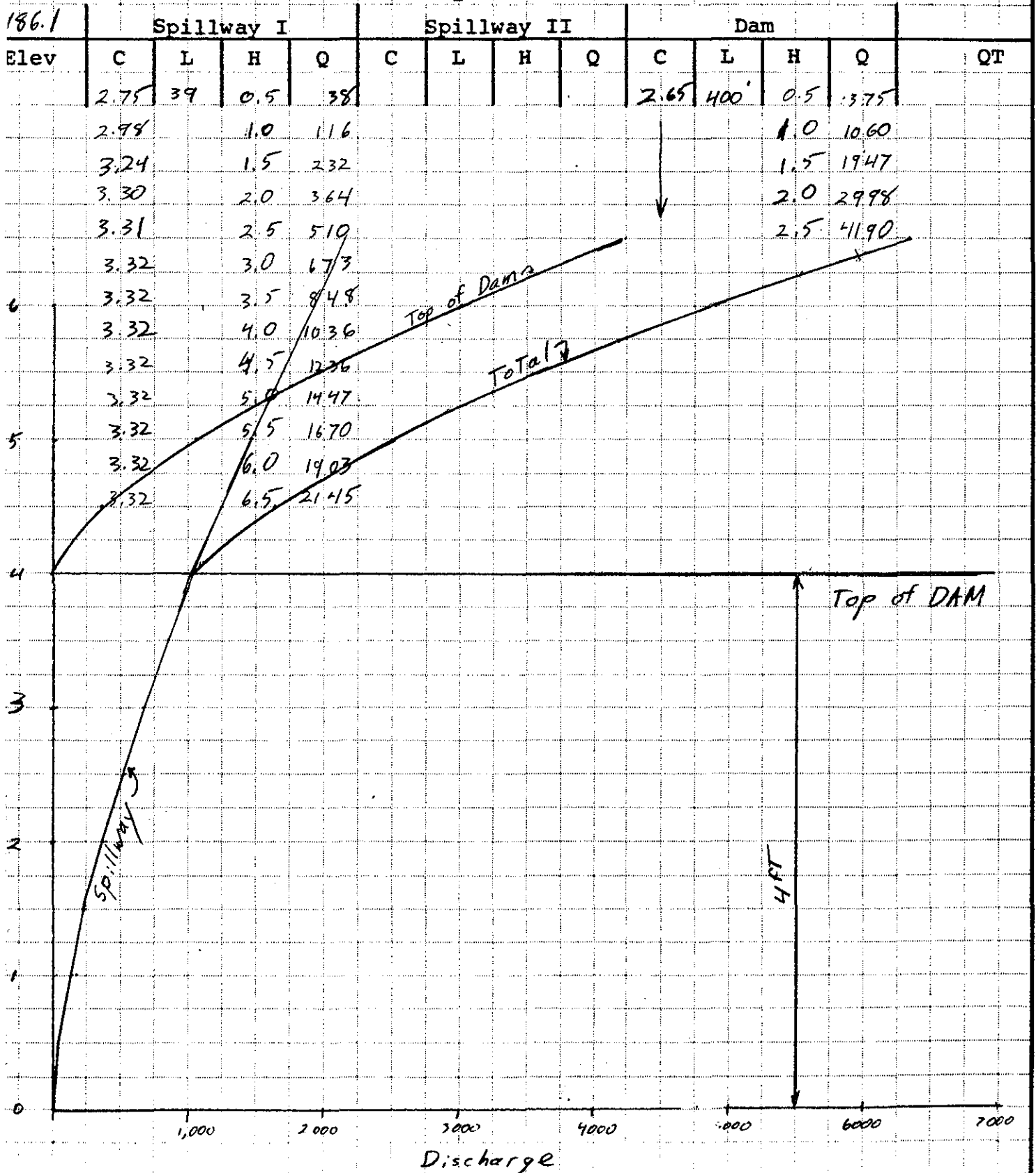
CALCULATED BY KJP DATE 4/25/80

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SCALE Stage Discharge

NAME OF DAM MERCERS POND DAM

$$Q = CLH^{3/2}$$



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JOB Phase I Dam Inspection 4463

SHEET NO. 5 OF 10

CALCULATED BY GJG DATE 4/16/80

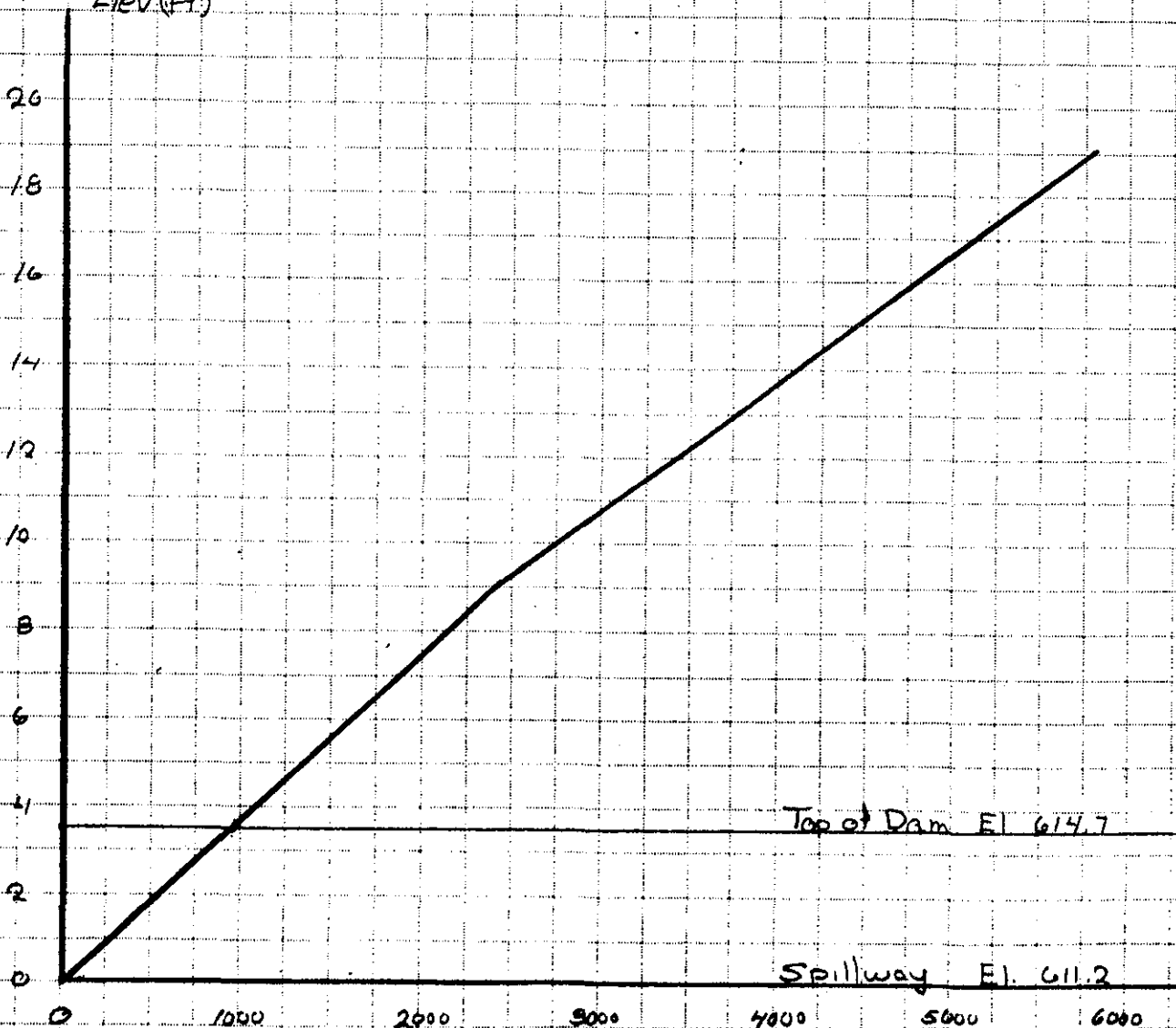
CHECKED BY BDC DATE 7/15/80

**AREA - CAPACITY**

Name of Dam: WEST LAKE RES. DAM

ELEV	DEPTH	AREA	AVG. AREA	VOL	Σ VOL
0.0		247.9			0.0
9.0	9.0	288.3	268.1	2413	2413
19.0	10.0	390.3	339.3	3393	5806

Storage below spillway is approximately 2440 Ac Ft  
Elev (ft)



Capacity (Ac Ft)

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JOB Phase I Dam Inspection 4463

SHEET NO. 6 OF 10

CALCULATED BY GJG DATE 4/16/80

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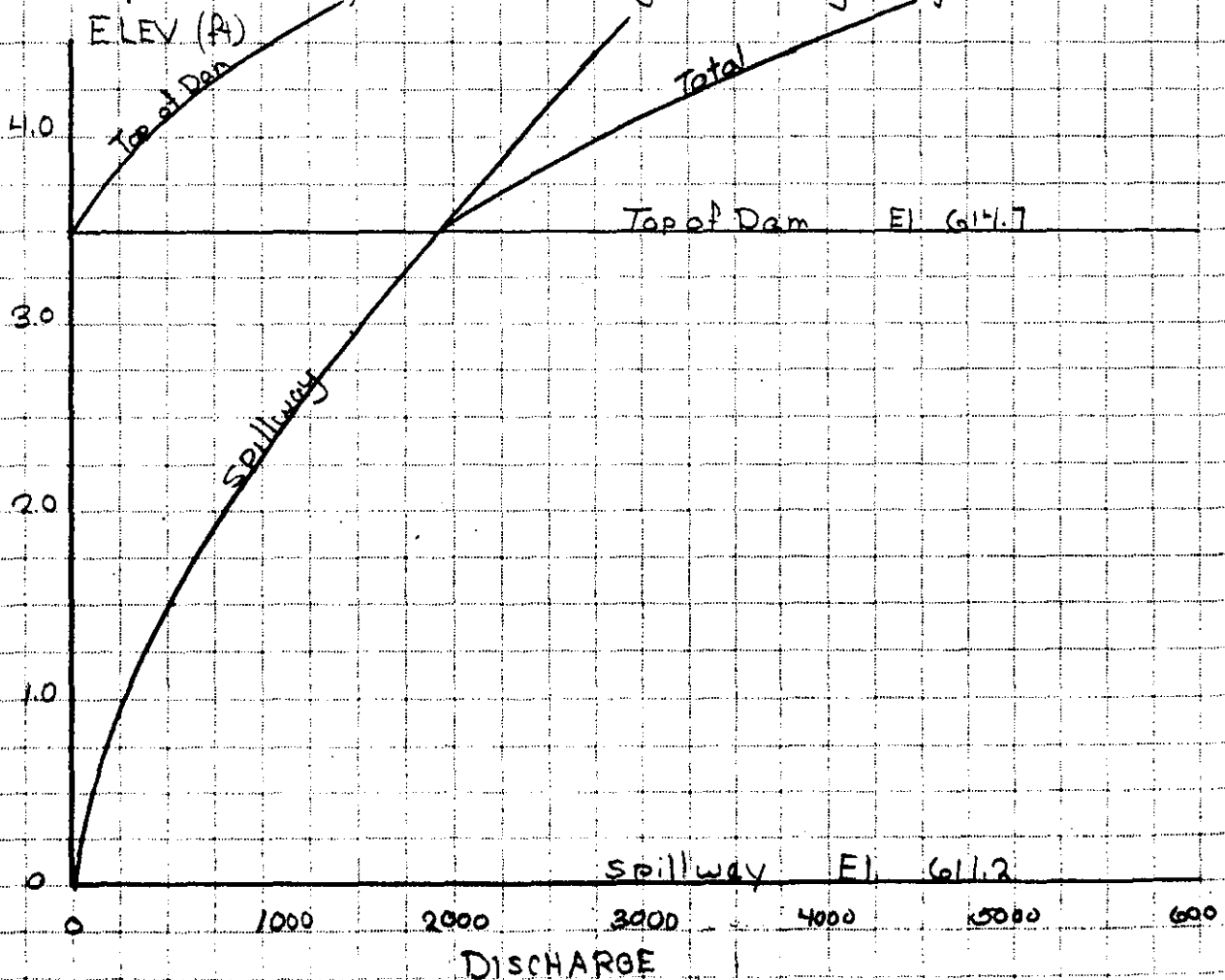
**Stage Discharge**

NAME OF DAM West Lake Res. Dam

$Q = CLH^{3/2}$

Elev	Spillway I *				Spillway II				Dam				QT
	C	L	H	Q	C	L	H	Q	C	L	H	Q	
	$H_T$	90	$d_c$										
0.75	.247		0.5	181					2.7	400	0.5	380	
1.49	.489		1.0	516					2.63	400	1.0	1050	
2.18	.681		1.5	924					2.63	400	1.5	1930	
2.95	.958		2.0	1480					2.63	400	2.0	2975	
3.68	1.18		2.5	2075					2.63	400	2.5	4185	
4.41	1.41		3.0	2750									
5.13	1.63		3.5	3480									
5.85	1.85		4.0	4280									

\* Equation 8-60; Handbook of Hydraulics by King & Brater  
ELEV (A)



Downstream Hydrographs

"Rule of Thumb" Guidance for Estimating Downstream Failure Hydrographs

NAME OF DAM MERCERS POND DAM

Section I at Dam

1.  $S = \frac{61}{827} \frac{\text{Acft}}{W_b \sqrt{g}} Y^{3/2} = \frac{827(100)(32.2)^{1/2}}{18^{3/2}} = 12,840 \text{ cfs}$
2.  $Q_{p1} = 8/27 W_b \sqrt{g} Y^{3/2} = 8/27(100)(32.2)^{1/2} 18^{3/2} = 12,840 \text{ cfs}$
3. See Sections

Section II at

- 4a.  $H_2 = \underline{10.5}$   $A_2 = \underline{1050}$   $L_2 = \underline{800}$   $V_2 = \underline{14.3}$  Acft
- b.  $Q_{p2} = Q_{p1} (1 - V_2/S) = \underline{9,781}$  cfs
- c.  $H_2 = \underline{8.8'}$   $A_2 = \underline{775}$   
 $A_A = \underline{912}$   $V_2 = \underline{16.7}$  Acft  
 $Q_{p2} = 9312 \text{ cfs}$

Section III at

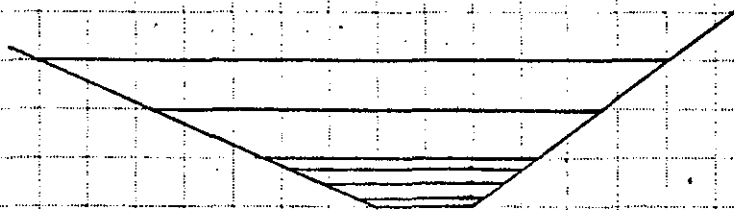
- 4a.  $H_3 = \underline{9.6}$   $A_3 = \underline{2300}$   $L_3 = \underline{600}$   $V_3 = \underline{31.6}$  Acft
- b.  $Q_{p3} = Q_{p2} (1 - V_3/S) = \underline{2670}$  cfs
- c.  $H_3 = \underline{5.7}$   $A_3 = \underline{910}$   
 $A_A = \underline{1605}$   $V_3 = \underline{22.1}$  Acft  
 $Q_{p3} = 4,666 \text{ cfs}$

Section IV at

- 4a.  $H_4 = \underline{7.0}$   $A_4 = \underline{1250}$   $L_4 = \underline{550}$   $V_4 = \underline{15.8}$  Acft
- b.  $Q_{p4} = Q_{p3} (1 - V_4/S) = \underline{1345}$  cfs
- c.  $H_4 = \underline{3.8}$   $A_4 = \underline{500}$   
 $A_A = \underline{875}$   $V_4 = \underline{11.0}$  Acft  
 $Q_{p4} = 2,354 \text{ cfs}$

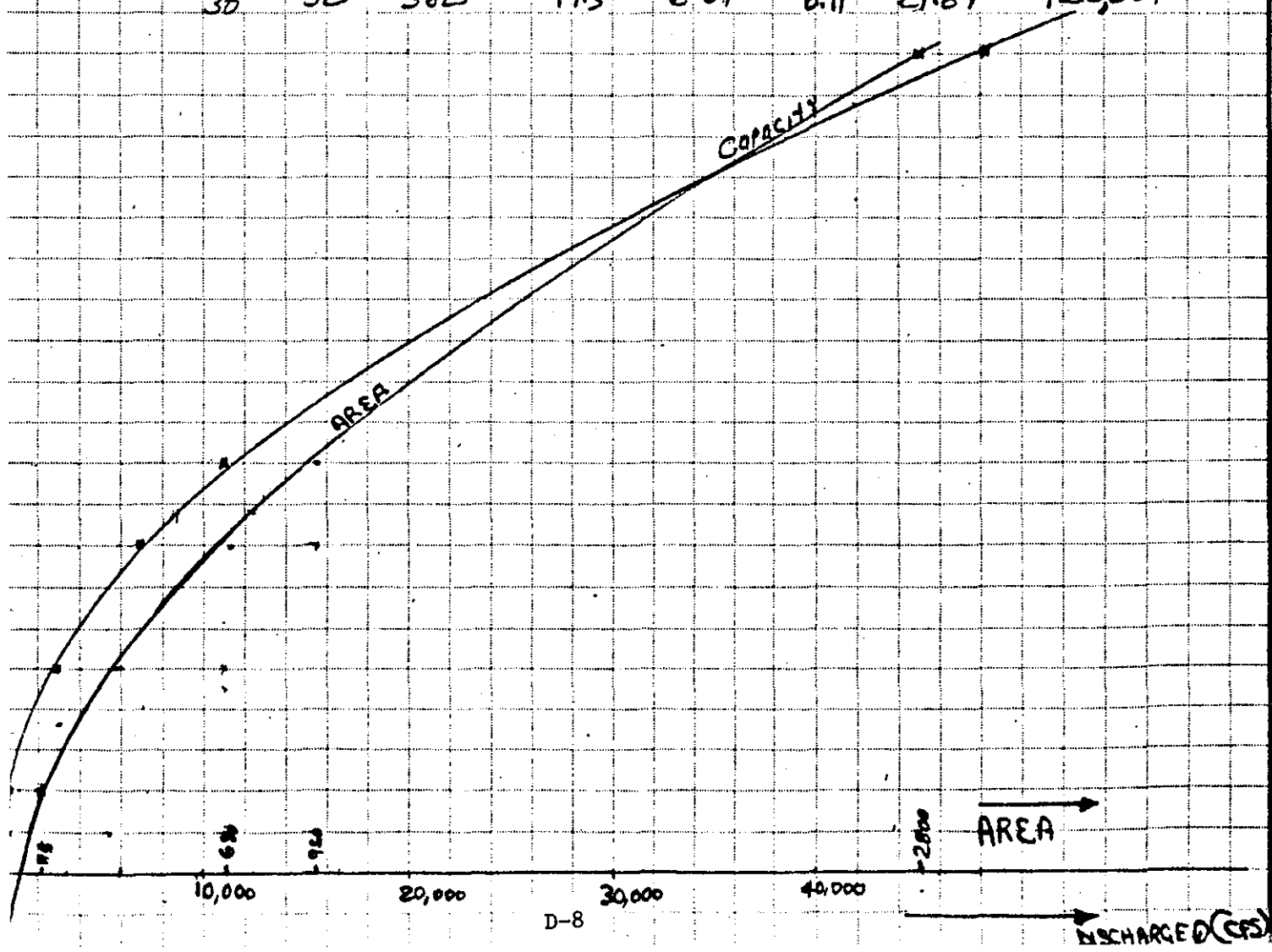
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JOB 41463  
 SHEET NO. 8 OF 10  
 CALCULATED BY BAH DATE 4/20/80  
 CHECKED BY BDC DATE 5/15/80  
 SCALE Section II



$n = .05$   
 $s = 1.25\%$

D	W	A	R	$R^2$	$S^2$	V	Q
2	65	115	1.77	1.46	0.11	4.77	549
5	93	358	3.85	2.46	0.11	8.04	2879
8	120	680	5.67	3.18	0.11	10.39	7069
10	140	950	6.79	3.58	0.11	11.70	11119
20	230	2800	12.17	5.29	0.11	17.29	48423
30	325	5625	17.3	6.69	0.11	21.87	123024



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4/4/63

SHEET NO.

9

OF

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CALCULATED BY

BAH

DATE

4/30/80

CHECKED BY

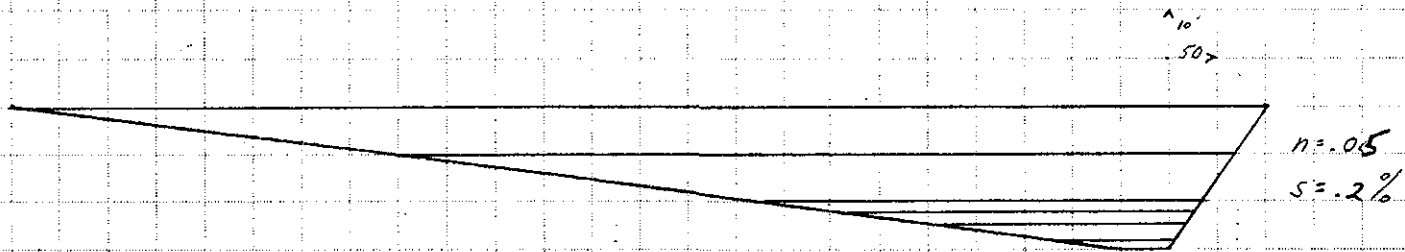
BDC

DATE

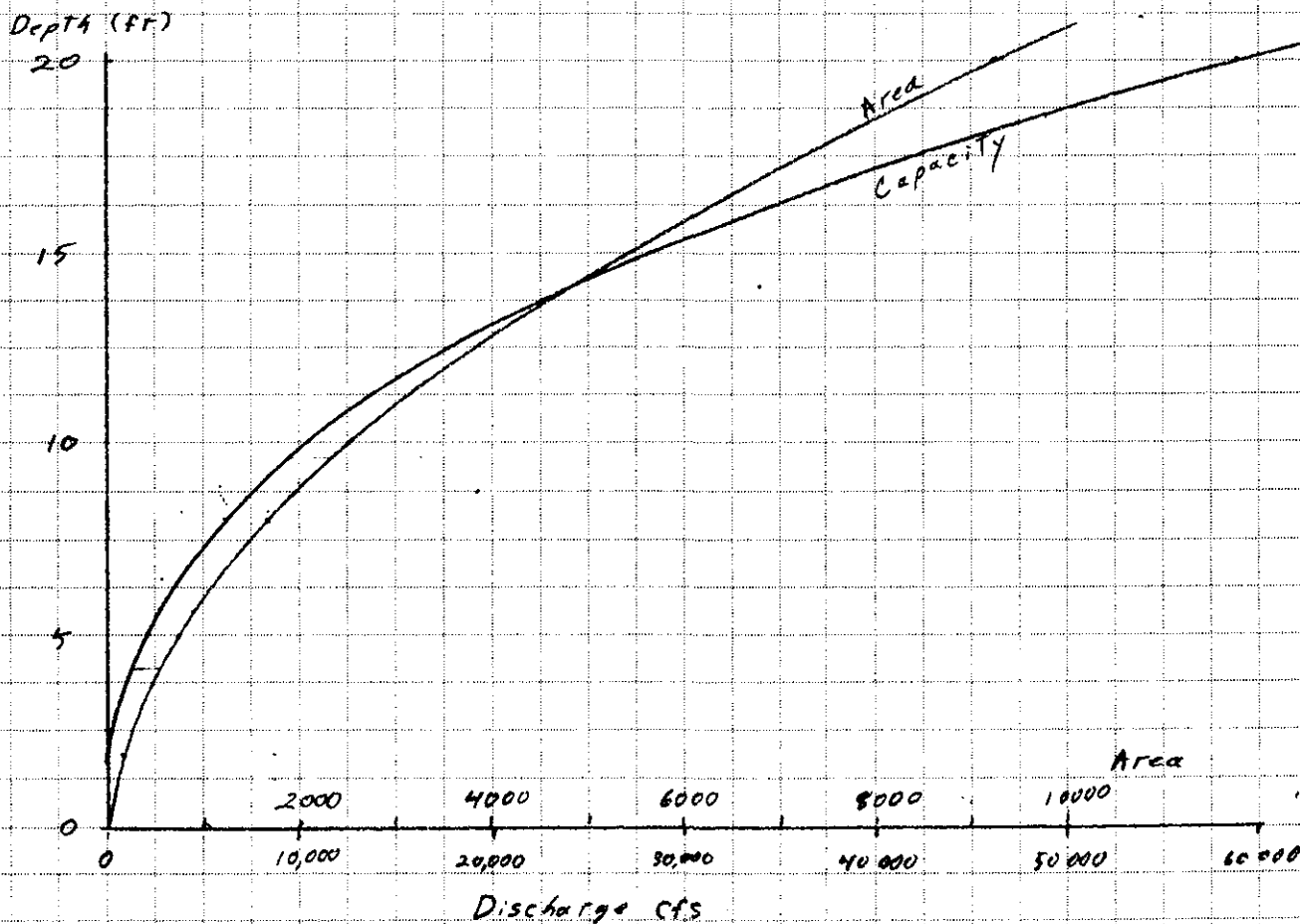
7/5/80

SCALE

Section III



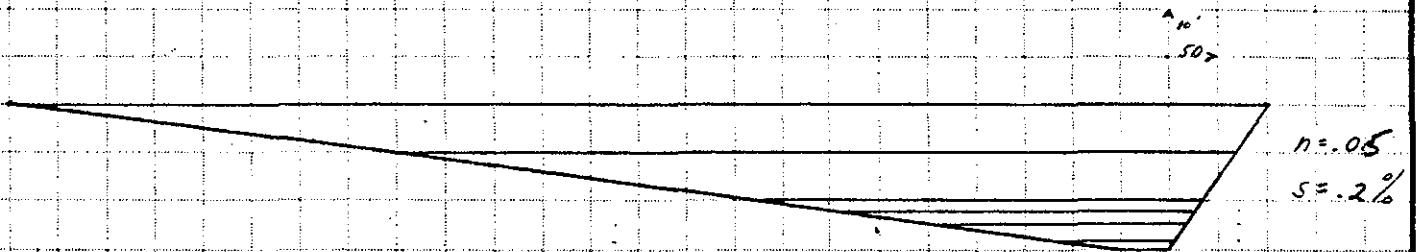
D	W	A	R	R <sup>3/2</sup>	S <sup>1/2</sup>	V	Q
2	120	170	1.416	1.26	.04472	1.676	285
5	250	350	3.000	2.08		2.764	2073
8	360	1640	4.556	2.75		3.652	5980
10	460	2525	5.489	3.11		4.136	10445
20	870	9200	10.57	4.82		6.402	54,900
30	1300	20250	15.58	6.23		8.280	168,000



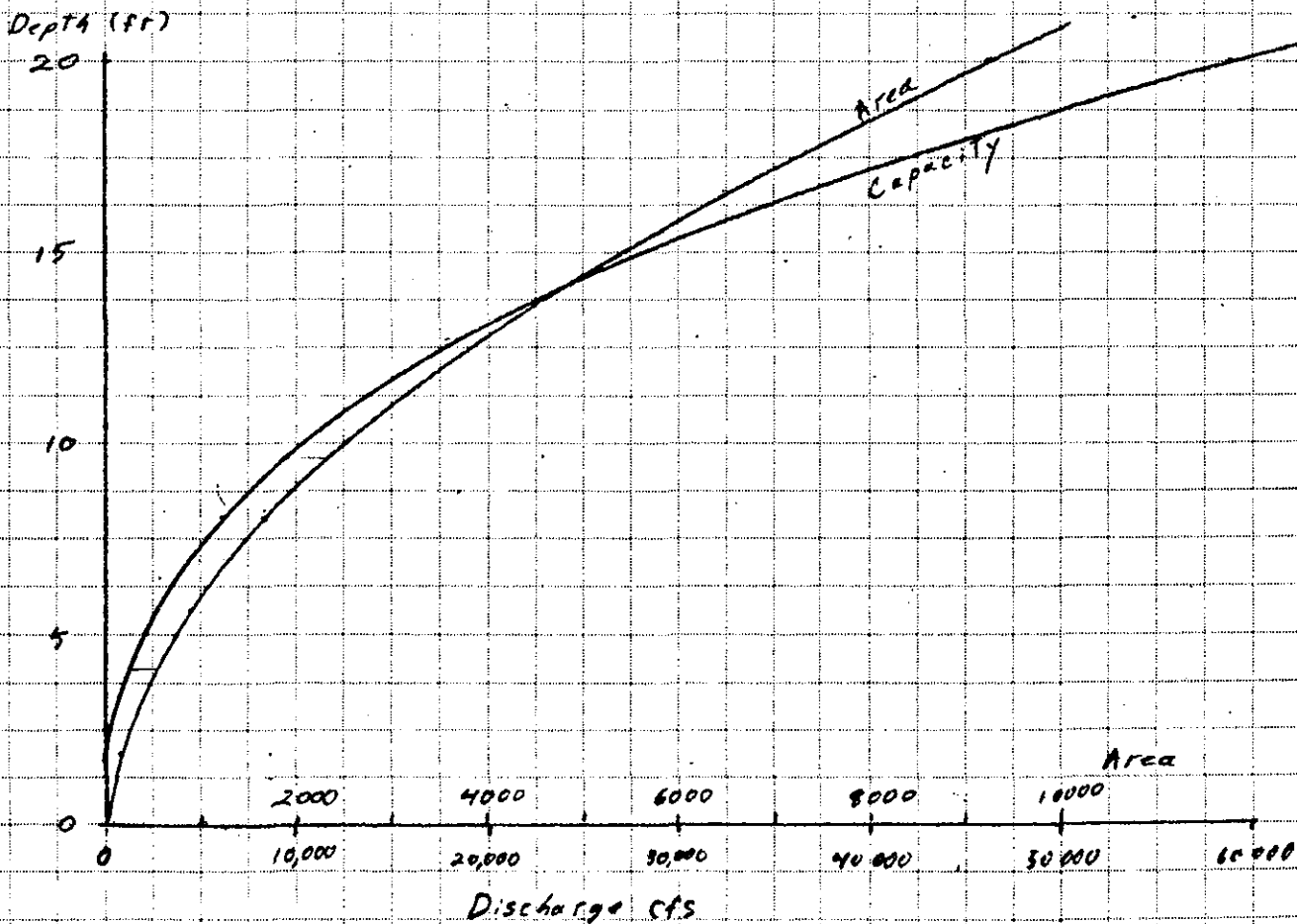
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JOB 4-163  
 SHEET NO. 10 OF 10  
 CALCULATED BY BAH DATE 4/30/80  
 CHECKED BY BDC DATE 7/15/80  
 SCALE Section IV



D	WP	A	R	R <sup>3/2</sup>	S <sup>1/2</sup>	V	Q
2	120	170	1.416	1.26	0.4472	1.676	285
5	250	750	3.000	2.08		2.764	2073
8	360	1640	4.556	2.75		3.652	5990
10	460	2525	5.489	3.11		4.136	10445
20	870	9200	10.57	4.82		6.402	54,900
30	1300	20250	15.58	6.23		8.290	168,000



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APPENDIX E

INFORMATION AS CONTAINED IN  
THE NATIONAL INVENTORY OF DAMS